

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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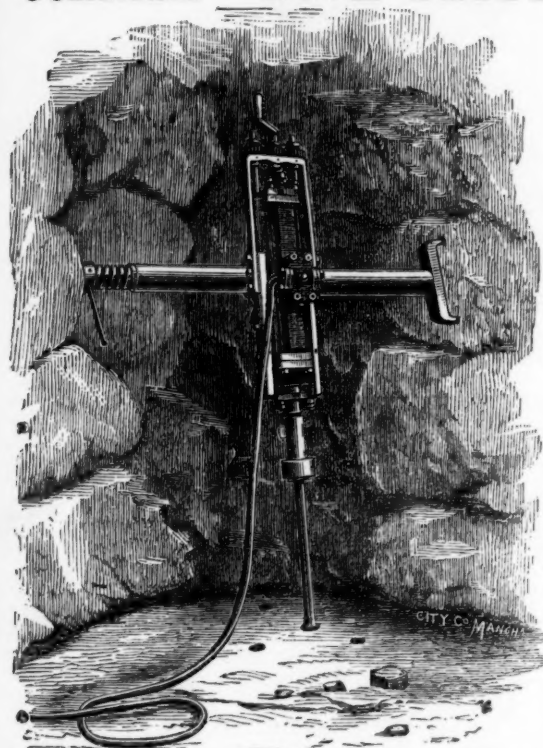
No. 2506.—Vol. LIII.

LONDON, SATURDAY, SEPTEMBER 1, 1883.

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—Highest Award for Effectiveness in Boring, and Economy in
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JUBILEE EXHIBITION, 1882.
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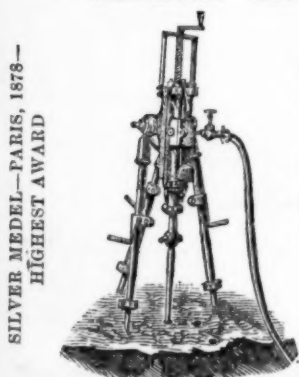


This Drill has been constructed after a long practical experience the requirements necessary for Mines, and has more than realised the expectations of its inventors. The chief objects in view were GREATER DURABILITY AND LESS LIABILITY TO DISARRANGEMENT; but it has also proved itself more EFFECTIVE AND ECONOMICAL.

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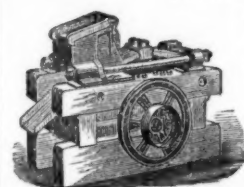
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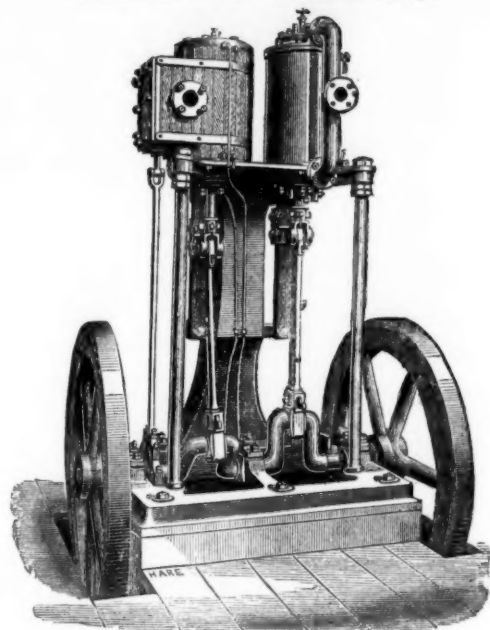
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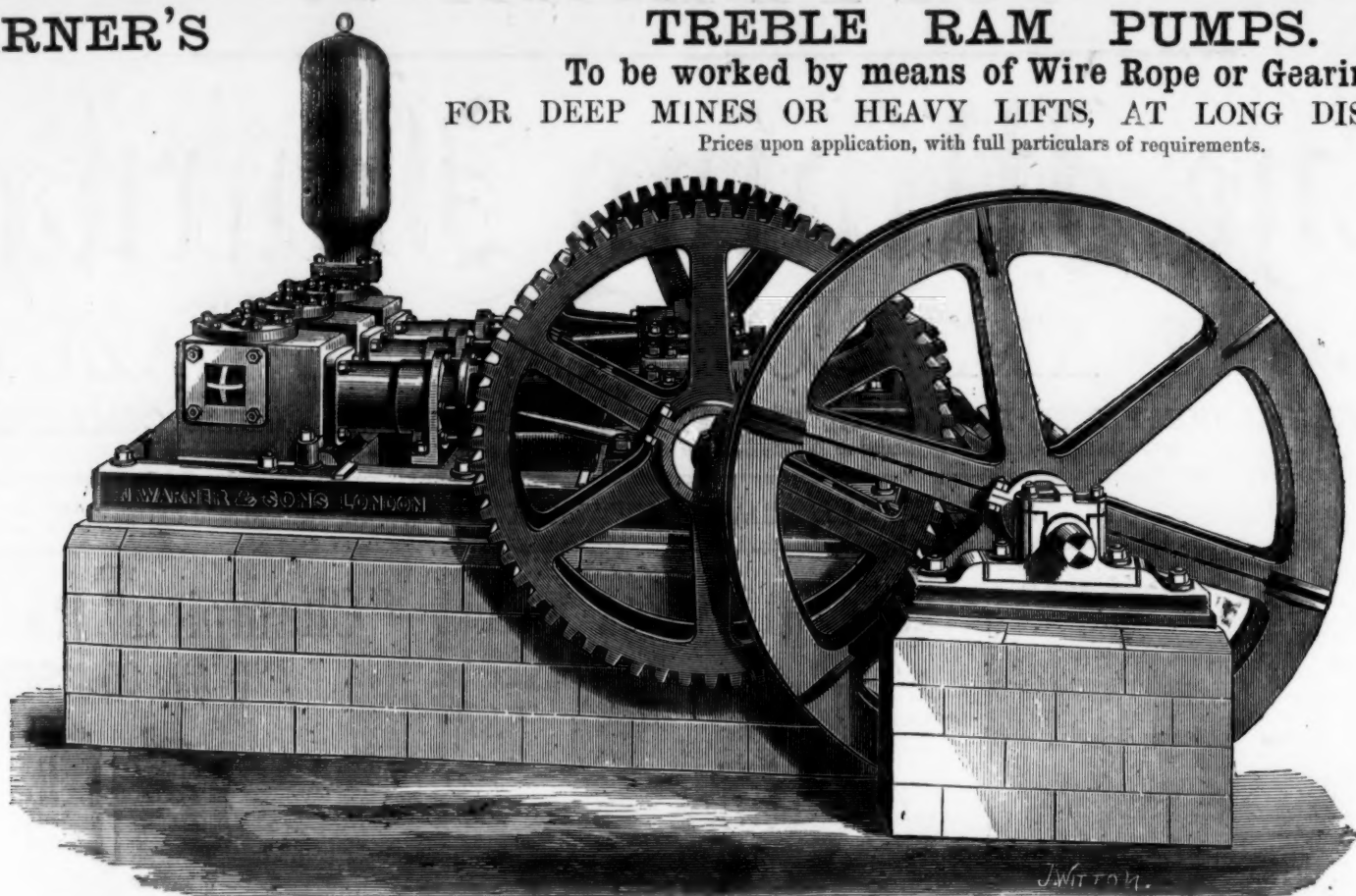
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CALLS PER HOUR	130	210	400	625	910	1280	1600
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PRICE	£10	£13	£16 1/2	£20 1/2	£24	£30	£32
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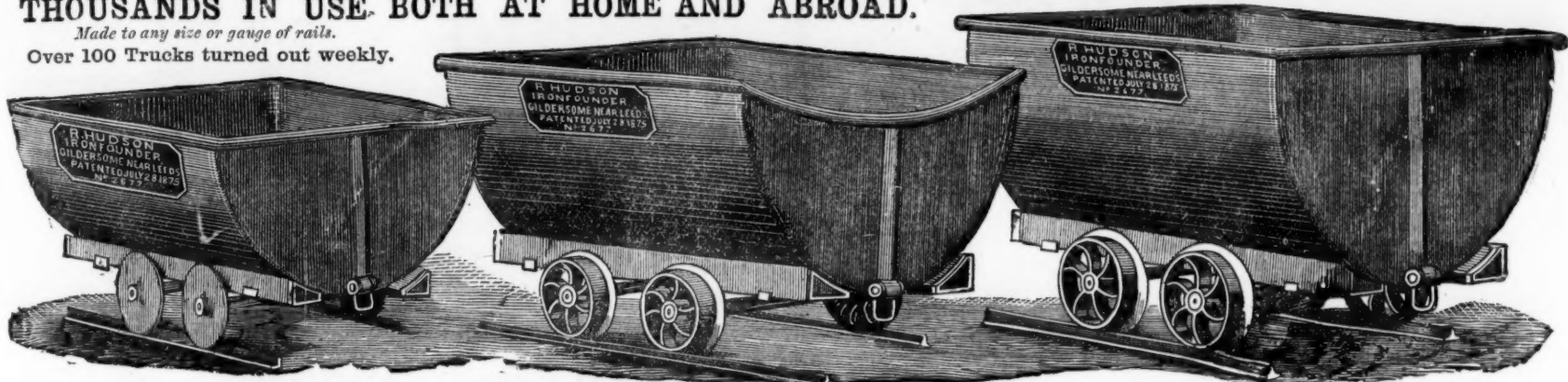
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This is the best and most economical Piston Packing in the market for High and Low Pressure Stationary Engines. Of course there are many worthless imitations of a Packing so universally approved of, but I am the Original Maker and Sole Manufacturer of the genuine article, as used in the British and German Navies. To avoid imposition, users should require to see my Trade Mark, which is on every 10 ft. length of the Packing made by me, and without this none is genuine.

The following Testimonials refers to this Packing:—

Mr. J. Bell, Asbestos Works, London. Sewage Works, Winchester, Jan. 12, 1883.
DEAR SIR,—I have great pleasure in saying that the Asbestos Packing I had from you is the best I have ever used, though I have used other Asbestos Packings not of your make. As an example, one of my piston rod glands was packed with it, and has been working night and day since October 26 without re-packing. I have not been able to run so long with any other make.

I am, Sir, yours truly, J. ASHCROFT, Chief Engineer.
Mr. John Bell, Asbestos Works, London. Portsmouth, February 20, 1883.
SIR,—Your Asbestos Steam Packing that you have been supplying for some considerable time I can recommend to steam users generally as being the very best that has ever introduced into the market for piston glands, slide throttle and throttle valve glands. I can after considerable experience say that it is the very best that I have ever used. We run our engine at between 80 and 90 revolutions per minute, and I may add that there is no work more trying than saw mill work.

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For Hot Water and Steam Pipes. to Prevent Radiation and Ensure Transmission of Heat; also to Protect from Frost.

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For Coating the Boilers of every kind of Marine and Stationary Engine. It is non-combustible, and can be easily and quickly applied at any time whether steam is up or not. It adheres to iron and metals and preserves them from rust.

The Maxim Weston Electric Company (Limited), 29, Bankside, London, S.E., 4th January, 1883.

Mr. John Bell, 118, Southwark Street, S.E.
DEAR SIR,—In answer to your request, I beg to inform you that I find the thermometer placed 3 feet above the boilers now stands at 93° before your covering was put on it used to stand at 126°. With regard to the saving in fuel I am unable to speak very accurately, as the boilers were not working long enough before being covered to ascertain the amount of fuel that would be consumed in an ordinary run; but I feel quite justified in saying that we burn less by about 5 cwt. per night than we were doing, and I shall be glad at any time to show the boilers to any one who may wish to see them, as I consider yours the best covering that I have up to the present seen.

BELL'S ASBESTOS BLOCKS & LUMPS FOR GAS FIRES.

BELL'S PURE CLOSELY WOVEN ASBESTOS CLOTH,

For Protection against Fire.

Foreman Engineers and others in charge of Machinery are invited to inspect BELL'S ASBESTOS GOODS at any of the undermentioned addresses, or to write for particulars.

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SILVER MEDAL (HIGHEST AWARD) MELBOURNE, 1881.

JOHN SPENCER,

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FIRST PRIZE, SYDNEY, 1880.

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TUBES

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It has been found very efficient for making bilge-pipe joints. It can be bent by hand, without puckering, to the form required, and is especially useful in making manhole and mud-hole doors; also for large "still" joints where boiling fat and acids of a kind have to be resisted. For these latter purpose it is kept in rolls of 100 feet, in various widths from 1 inch to 2½ inches wide, by ½ inch to ¾ inch thick. Manhole cover joints made of this material can be lifted 20 times before renewal is necessary. This Tape is also made in any width and thickness, so that it is suitable for every class of joint. It is also made in sheets about 40 inches square, from ½ inch thick upwards, and each sheet bears my Trade Mark to protect users against Trade Mark, and users are earnestly requested to see that this label is attached, to prevent imposition by worthless imitations.

The engineer of a world-renowned firm writes:—"There is not, nor can there be, any doubt as to the excellence of your Asbestos and India-rubber Woven Sheet—as a jointing material it is unrivalled."

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BELL'S ASBESTOS YARN AND SOAPSTONE PACKING,

For Locomotive Engines, Cranes, &c.

The following Testimonial refers to this packing:—
Festiniog Railway, Locomotive Superintendent's Office, Portmadoc, Jan. 13th, 1883.

Mr. John Bell, 118, Southwark-street, S.E.
DEAR SIR,—I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed, better than we expected. We have a locomotive packed with it, and has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting packing. The Asbestos Yarn we find is very useful, and answers admirably.

BELL'S ASBESTOS ROLLED CLOTH PACKING,

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SIR,—I have great pleasure in reporting on your Asbestos Cloth Rope Packing which you sent me on trial. I tried it in one of two H.P. Piston Rods, and it ran 90 days without repacking. The other H.P. Piston Rod was packed with a similar form of packing, not composed of Asbestos, and was repacked 10 times during the 90 days. I have recommended it both at Sydney and Melbourne, and shall do my best to take this packing in whatever steamers I may have to do with.

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THE EXCELSIOR ROCK DRILL.

The construction of this Drill is remarkably simple. There being ONLY ONE MOVING PART—the piston—it is almost impossible to get out of order. The air is taken in through the gland, and by a peculiar arrangement of ports and passages the motion of the piston automatically admits and cuts off the supply of air to each end of the cylinder.

Its chief advantages are simplicity, durability, strength, and lightness, economy in first cost, consumption of air and repairs, adjustability of cradle and length of feed. Invaluable for use in foreign countries where repairs are so difficult and expensive. The makers undertake to keep the machine in repair entirely free of cost for six months from date of purchase. In order to prove the superiority of these machines, the makers are prepared to send one on trial to any Mining or Tunnelling Company, they being at perfect liberty either to keep it or return it after trial.

For prices, particulars, &c., apply to—
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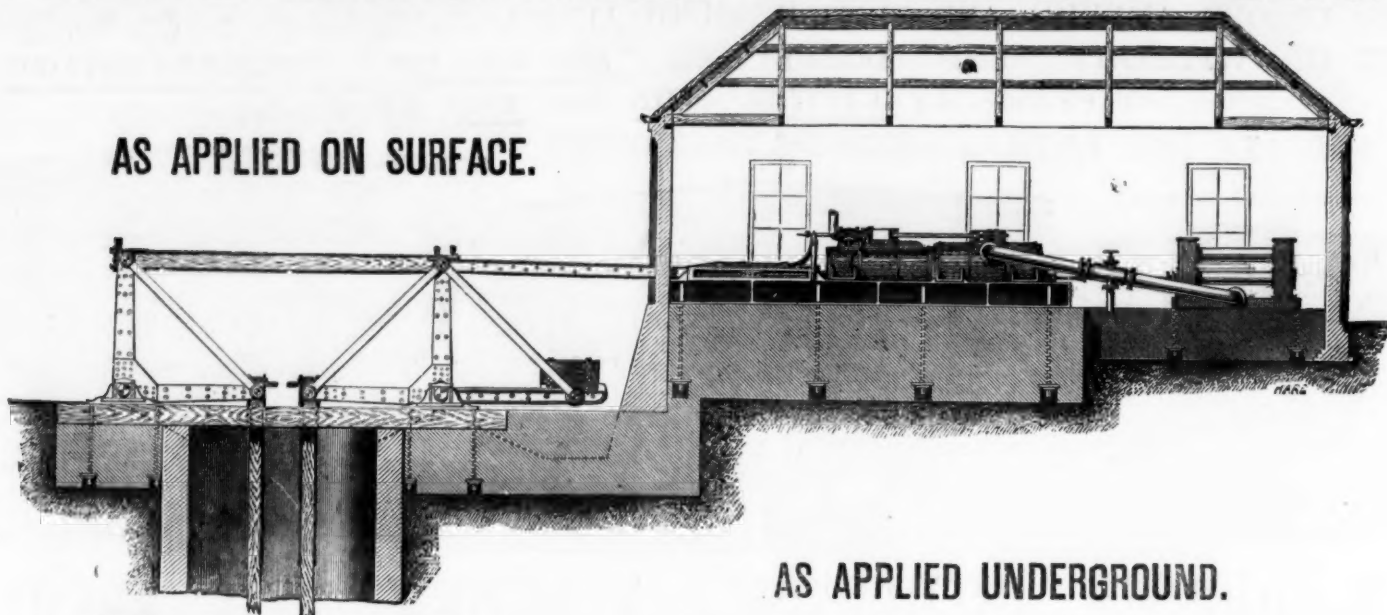
ALEX. DEL MAR.

Mining Engineer, late Director of the United States Bureau of Statistics. Mining Commissioner for the United States Monetary Commission, &c., 216, SANSONE STREET, SAN FRANCISCO. Cable Address: "Delmar, San Francisco."—Branch Offices: 61, Broadway, New York; and 77, Cornhill, London, E.C. Particular attention paid to Hydraulic Mines and Mining Machinery.

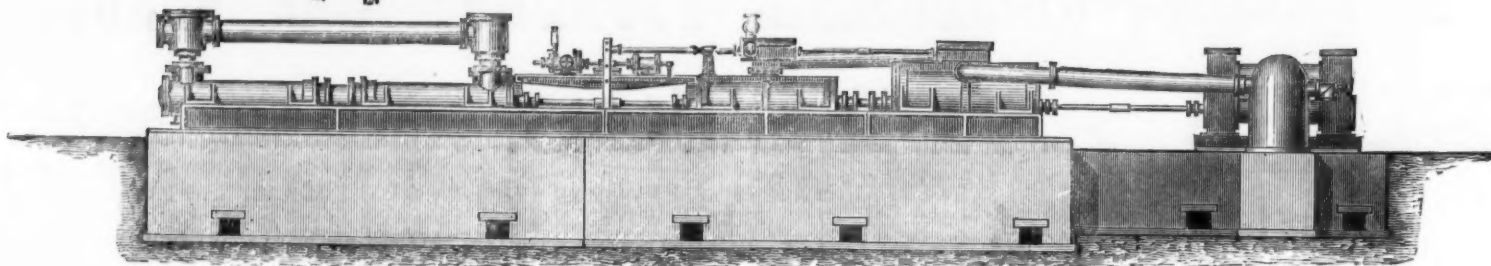
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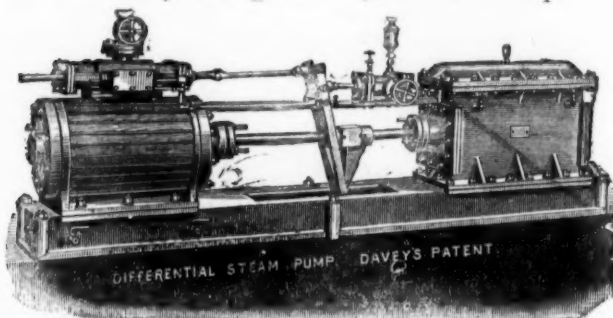


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THE DIFFERENTIAL STEAM PUMP.

The only Self-governing Steam Pump.



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Diameter of Steam Cylinder, Inches.	Diameter of Water Cylinder, Inches.	Length of stroke, Inches.	Gallons per Hour.	Height to which water can be raised with 40 lbs. steam pressure, Feet.	PRICE.	Price with Condenser, in Suction Pipe.	Price with Air Pump Condenser.	Diameter of Suction and Delivery Pipes, Inches.	Diam. of Steam Pipe, Inches.	Diameter of Exhaust Pipe, Inches.
10	5	15	5,200	250	65	72	85	5 1/2	1 1/2	2 1/2
10	7	15	10,400	130	70	80	100	6	1 1/2	2 1/2
10	9	15	17,300	70	85	100	120	4 1/2	1 1/2	2 1/2
12	6	24	6,500	250	90	104	130	5 1/2	2	2 1/2
12	7	24	10,500	180	96	110	136	6	2	2 1/2
12	8	24	13,500	140	100	114	142	7	2	2 1/2
12	10	24	21,300	90	120	136	175	5 1/2	2	2 1/2
14	7	24	10,400	250	110	130	156	6 1/2	2 1/2	3
14	8	24	13,500	190	120	145	165	6	2 1/2	3
14	9	24	17,300	150	130	150	172	6 1/2	2 1/2	3
14	10	24	21,300	120	140	162	190	7 1/2	2 1/2	3
14	12	24	30,800	80	160	190	216	9	2 1/2	3
16	8	24	13,700	250	140	170	195	6	3	3 1/2
16	9	24	17,300	200	150	180	215	6 1/2	3	3 1/2
16	10	24	21,300	160	160	196	225	7 1/2	3	3 1/2
16	12	24	30,800	110	180	220	246	9	3	3 1/2
16	14	24	42,000	80	200	242	264	10 1/2	3	3 1/2

PATENT BRIQUETTE MACHINE.

GREAT SAVING NO WASTE COAL.

NO COLLIERY SHOULD BE WITHOUT.

These Machines utilise small coal or coke by making it into Briquettes or blocks compressed fuel at the rate of 36,000 per day. The cost of preparing, mixing, and making is under One Shilling per ton. The Briquettes sell readily for Locomotives, Household, or other purposes. Full particulars on application to

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ENGINEERS AND CONTRACTORS

FOR EVERY DESCRIPTION OF PLANT FOR

Collieries, Mines, and Brickworks,

TESTIMONIALS

Messrs. Yeadon and Co., Lee
I continue to be perfectly satisfied with the work performed by the two patent Briquette Machines as well as with that of the Steam Engine, Mixer, &c., which you supplied a few months ago for the manufacture of compressed slack Briquettes, and that I can recommend them as being the best machines I know of, after having carefully studied all the Briquette Machines constructed at home and abroad.
SOCIETE DES CHARBONNAGES REUNIS DU RIEU DU CŒUR ET DE LA BOULE. QUAREGNON (BELGIUM), SEPTEMBER 13TH, 1879
We are entirely satisfied with the erection and working of the two Briquette Machines, as well as the Steam Engine and Mixing Apparatus.
Messrs. Yeadon and Co., Leeds.
I continue to be highly satisfied with the Briquette Machines which you supplied in 1877. They do their work very well, and produce the Briquettes very regularly, and of a good quality.
Messrs. Yeadon and Co.
I have the honour to inform you that the Briquette Machines work very well. The Briquettes are very well made. I am highly satisfied with your workmen, who have done their work very well.
The undersigned, Civil Engineer of Mines, Chevalier of the Legion of Honor, Consulting Engineer to the Mines de Vendin-lez-to, Bethune, Pas-de-Calais, certifies that the Briquette Machinery for making Briquettes of Coal, supplied by Messrs. Yeadon and Co. to the above Company is working to their entire satisfaction.
Lille, December 28, 1880

CHARBONNAGE DE BERNISSART, PRES PERUWELZ (BELGIUM), JANUARY 4TH, 1878.
A. FRANEAU, Managing Director.
CHARBONNAGE DE BERNISSART, PRES PERUWELZ, JANUARY 24TH, 1879
G. FAGES, General Manager.
SOCIETE HOUILLERE DE VENDIN-LEX-BETHUNE, PAS-DE-CALAIS, DECEMBER 2ND, 1880.
SYLVA CATTIER, General Manager.
E. LISBET.

THE PACIFIC WATER-JACKET SMELTERS.

The vast mineral deposits of smelting ore now being developed in all parts of Arizona has created a large demand for the most approved means of reduction. The water-jacket smelters for both galena and copper ores made by the Pacific Ironworks, Rankin, Brayton and Co., of San Francisco, seem to have met all the requirements in this way, and have so far been universally successful in working every class of ores found in this Territory. All our most enterprising companies are using them in preference to any other make, and, so far as we can learn, with the most satisfactory results. We recall no instances in which anything like a failure has been made with these smelters, while many others have wrecked the fortunes of those who have put their trust in them.

These smelters unquestionably embrace the most perfect mechanical appliances now known for the treatment of all classes of smelting ores, and their general adoption has greatly stimulated mining development, and contributed much to the material advancement of this interest in the mining States and Territories.
—Arizona Sentinel, U.S.A.

CASSELL'S PUBLICATIONS.—Archdeacon Farrar's Life and Work of St. Paul, part 20, discusses Paul's notion of the Law which, if the author's view be adopted, certainly seems to have been somewhat astounding. If it be true that "the Law though not the cause of sin is yet the occasion of it," then the only logical conclusion is that the less is known of the Law the less sin will exist, and all the Archdeacon's efforts to pervert the meaning of a proposition which he so clearly enunciates will but do more harm than good to the cause of true religion generally, and to Protestantism in particular. The assertion that "the Law produces reflection on the forbidden object, curiosity, doubt, distrust, imagination, lust, susceptibility of the seed of temptation, and of seduction, and finally rebellion" is grossly absurd on the face of it, and it is extremely doubtful whether even Archdeacon Farrar would attempt to defend before any competent tribunal—the members of which had either studied the Sacred Volume or acquired in any way the power of utilising those marvellous reasoning faculties with which their Creator has gifted them—so untenable and blasphemous a proposition. In discussing any subject it is always preferable to consider the quality than the quantity of the assertions to be used as arguments; and it is better to admit that a statement is unintelligible than carelessly to attempt an elucidation which would throw doubt not only on the statement itself, but upon the whole of the book in which it appears. The part also contains a chapter on predestination and free will, and the beginning of that on the last journey to Jerusalem.—Knight's Practical Dictionary of Mechanics, part 81, extends from Three-cylinder pump to Tool.

Original Correspondence.

MINERAL RESOURCES OF NORTH CAROLINA—
HOOVER HILL.

SIR,—In last week's *Mining Journal* I notice that at a general meeting of the Hoover Hill Mining Company the Chairman was asked whether he knew of any paying gold mines in North Carolina, and I was sorry to see that he was unable to answer that question in a satisfactory way. It bears out my statement, however, that North Carolina is an almost unknown territory to English investors.

With regard to gold mining in North Carolina Mr. Charles G. Mann, M.E., writing from High Point, N.C., to the *New York Mining Record*, says:—"According to one of the leading newspapers of this State, there are at present about 50 gold mines in active operation in North Carolina. It is, however, very difficult to get at the correct amount of their production, because they are mostly worked by private associations, who keep their business secrets to themselves, having no stock afloat on the mining exchanges of the centres of capital; but we may take it for granted that the business pays, or work would soon be stopped. I have tried to get at the proceeds of some of these mines, when worked before the war with the crudest machinery imaginable, invariably excluding the stamp mill, as I have repeatedly alluded to in former letters.

The authentic records of the Gold Hill Mine in Rowan county, 800 ft. deep, go as high as \$3,000,000, and another million or more can be taken out of the heap of the tailings. That this property has gone into the hands of British capitalists your readers know from my former reports. The King's Mountain Mine, worked to the depth of only 200 ft., produced more than \$1,000,000. The product of the Rudisill Mine, one mile from the city of Charlotte, of the same depth, reached about the same amount. The Lindsay Mine, 4 miles from here, 210 ft. deep, produced nearly \$2,000,000, and \$1,000,000 more can be taken out of the tailings, lying loose in a ravine behind the ancient mill-house; of these numerous assays have been made varying from \$20 to \$42 per ton.

The Ore Knob Mine in Ashe county produced last year \$1,600,000 of pig copper, and the Conrad Hill Mine in Davidson county is nearly as good, and has for 40 years been considered the best paying gold mine in the State, although its main product is sulphure of copper. Some of its veins reach for miles beyond the tract, and have been opened by me quite recently, showing the same rich combination of gold and copper.

Among the Montgomery county mines the Russell has the best record, coming up to nearly \$1,000,000, but is at present lying dormant. I must not omit to mention the Old North State Mine, a few miles from here, and the Silver Hill Mine in Davidson county, the product of which must have been very large to judge from the amount of work done, and the extensive heaps of valuable ore on the ground, but the amount has never become known to the outside world. Both of these mines have recently been taken in hand again, and are now vigorously worked.

The placers of this State have thus far been almost entirely neglected, except by their owners, who work them with pan and shovel, when they are in want of a few dollars, and not otherwise engaged on their farms. Two years ago I examined a small tract of 140 acres in Catawba county which is now worked by private parties, producing about \$100 per day, although there was from the outset some difficulty in procuring the necessary amount of water. Another placer on the foot of the hills of the Appalachian chain of mountains, to the extent of 1200 acres, with plenty of water at an elevation of 80 ft., is now in the market at a very low figure, and promises to be much richer. The gold of these tracts is of a high grade, 980 fine, and its shape is invariably nuggety, so that there is little danger of losing the scales. In some panning I saw pieces from 4 dwts. to 2 ozs. If this piece of property falls into the right hands it will not alone be a source of large profit to the owners who work it for many years to come, but it will serve to demonstrate that placer mining proper can be carried on in North Carolina with the same success as in California.

I mention these facts in answer to numerous enquiries which I have received of late expressing doubts if there were actually good productive mines in this State. If proper machinery and scientific experience had been employed in former times the yield of all the above-mentioned mines would have been ten fold that which it actually was. Prospecting and opening mines came to an end with the setting in of last month's rains, which still continue unabated and make locomotion on the ferruginous red clay roads almost impossible. Our average rainfall is 52 to 57 in. per year, and Nature is compensating us for the lack of it during last summer, when everybody was inclined to believe that new meteorological laws had been inaugurated, and a great deal of nonsense was promulgated at the expense of the comets.

The Ore Knob Copper Mine, of Ashe county, is also favourably referred to by Mr. J. F. McKee, who states that the property was opened in 1873 by Mr. Jas. E. Clayton, of Baltimore, and has worked steadily ever since, at times employing over 1000 men. The product of copper has exceeded 10,000,000 lbs., of a value of over \$2,000,000. The mine paid its shareholders in 1879 \$210,000 cash in dividends. It has been more largely worked than any other mine in the South, and has proven that our home mines have great value when properly developed. The ore is of ordinary richness, a sulphide of copper and iron, but large quantities are mined—from 40,000 to 45,000 tons—yearly. The plant is very extensive, consisting of some 12 smelting furnaces, refinery, and other smelting adjuncts; and the whole outlay for developing and improvements cost over \$600,000, all of which was paid for from profits except \$200,000. The mine is now being sunk deeper and promises greater profits in the future than in the past, and will likely be the leading mine of the South for many years to come.

Quite an interesting article was recently published in the *Carolina Watchman* concerning the mineral wealth of the State. It is remarked that there seems to be quite a healthy outlook for North Carolina mining properties in Boston. The Carolina Queen Mining Company is just paying its seventh dividend. The gold returns up to this came from their large placer deposits. They own about 900 acres of land upon which extensive developments have been made, exposing five large fissure veins—they have about 1000 tons of ore on the dump, and many thousand in depth, and are now putting up a full and complete plant of machinery to sack their ore—in addition to the above they are going to plant about 50 acres of tobacco from which handsome returns are looked for. The Queen is one of the best mining properties in North Carolina, and their success has induced the purchase of several other mining properties in their immediate vicinity. The Soap Stone Hollow Mining Company have just completed their hydraulic developments, and have exposed several large fissure veins carrying coarse free gold in large nuggets. The mine is destined to be one of the best in Burke county.

The Glen Alpine Mining Company are also making good progress in their works—in addition to solid veins they have mica and kaoline in large quantities upon their property. The Little Princess Mining Company have begun to work with rich showings of placer deposits, and numerous veins outcropping, the ore from which assayed by mill run test show \$104 per ton. The Hancock Mining Company have made splendid progress in their placer washings, and their stock is quoted at \$9 per share; all the above mines are located at Brindleton in Burke county, within half a mile of each other, and that section of North Carolina looks now like an old California mining camp. The Southern Belle Mining Company, whose property is near Salisbury, are very active in getting their valuable property ready for further development, and work will soon begin in earnest; a mill run assay of a ton of their ore resulted in \$89 in gold and \$4.90 in silver; they have a large amount of ore on the dump.

With regard to the Hoover Hill it is mentioned that from 2 tons of selected ore 91 ozs. of amalgam was obtained, worth in refined gold about 50 per cent. of the above weight. This was picked ore, and each piece showed free gold. It is not pretended that it was anything like an average, but an exceedingly rich streak in the vein.

And it is evident that gold, copper, and iron do not constitute the whole mineral wealth of North Carolina, for the *Reidsville Times* announces "A Seven Thousand Dollar Diamond found in Stokes

county." It appears that Mr. James Pepper, of Danbury, went up in the Sauratown Mountain sometime ago to get sand from a creek bed to scatter over his yard. As he had scattered the sand he noticed something lying shining very bright, and picking it up discovered it was a diamond. He took it to Danbury and Winston, where it was pronounced a stone of great value, and then he sent it to Baltimore, where they examined it and returned it, pronouncing its value at \$7000. Prof. Kerr thought it hardly worth so much. The old gentleman keeps it wrapped up in the bottom drawer of his safe, and is very particular in showing it to strangers. Tiffany and Co. wanted him to express it to them at New York, but he is rather afraid they will put on a value to suit themselves. The diamond is the size of a small chestnut.

The above extracts from local papers may enlighten the Hoover Hill shareholders as to the possibilities of this State. I would also refer them to my letter in the *Mining Journal* of Aug. 18. I should be most happy to co-operate with any gentlemen who are interested in the matter, and give every information in my power respecting this section of the United States. M. PARRY GOSSET.

Old Broad Street, Aug. 25.

NEVADA MINING—A PROPER SYSTEM YET TO BE
INAUGURATED.

SIR,—It has often been said that there are mines and mines, the significance of which if at all understood appears to be to a large extent disregarded. If properly classified it would be found that in all mining localities a gradation of mines, not merely progressive but relative in value one to another would appear, and this holds good in respect of them at every stage of their development—in-occupant, progressive, and advanced. In treating of mining in this State on the present occasion I shall confine my remarks to two classes in general, each of which include gradation in the order and degree of merit. They are the sensational and the *bona fide* solid properties of intelligent investors. There is nothing surprising in the event of the sensational taking precedence of the more solid. Substantial and permanently prolific class in amateur minership—especially in newly discovered rich mineral regions, to the pioneers of which the salient features of improving metalliferous outcrops are more impressive and captivating than the modestly appealing characteristics of other sections whose more elaborately indicated wealth lies embosomed in the undisturbed recesses of true fissure veins, which are to the practically experienced miner intelligible in outline. Masculine in the proportional development of their capacity, permanently continuous in the lines of their indicated courses, and increasingly productive at depths exceedingly beneath which the sensational ceases to exist. Such spasmodic ebullitions are, though not unnatural, illegitimate products, or legitimate only in the order of their dismemberment, disintegration, and final dissolution, an episode on the post meridian side of material being, and a prelude to the gneiss of other states and conditions. It is not always, however, that sensational metalliferous occurrences are fatally deceptive, as true fissure veins of the most permanent and prolific class are found in sundry instances to indicate the vast wealth they contain by certain thrilling revelations at or near the surface, the true value of which can only be correctly judged of and determined by an intelligent reference to the geological formation of the immediate and contiguous locality, and the practically experimental results of analogous conditions elsewhere. Science in its relation to this branch of mining is as much talked of and as little observed in this part of the world as in any other that I know of, and probably a little more so. Occular evidence in practice takes precedence of scientific knowledge and its demonstrated realities. The occular effect obscures the intellectual vision, and precocious sense dominates reason, fills the eye, satisfies the mind, and gratifies an ignorant ambition, one of the consequences of which is that the ephemerals are widely popular, whilst properties of infinitely surpassing value remain dormant and neglected. These practices and pursuits have been perpetuated through nearly a quarter of a century in this State, and with results which should have long since resulted in a different course of action. The experiences and analogies of other countries are the best guides and exponents in this, and any deviation therefrom except in the matter of detail, unless under very special exceptional conditions, which do not often occur, will involve a serious liability to error, embarrassment, and disaster, as the general laws prevailing in the mineral realm of Nature are not subordinated by local conditions, but local conditions by them. Differences may appear, but they are differences of degree rather than of kind arising from the more or less protracted action of producing causes, of which the dynamically mechanical, if not the most effective, is the most conspicuous. It is true in the interest of mining and of individuals that a descent was made to the region of knowledge, human probability, and common sense. Knowledge is indispensable, and probability and common sense are necessarily essential to the proper conduct and success of mining, and until these three most vital conditions are more fully and generally complied with and subscribed to, the legitimate record of this leading industry will remain unwritten, and its balance-sheet from year to year and period to period be but a partial and unsatisfactory exponent of its product and pecuniary results.

The curse of foreign mining has been the paying of exorbitant sums for mines of questionable value, and in some cases for others of no value whatever. If a fiftieth part of the money which has been lavished in this way on artificially furnished and elaborately decorated concerns, whose only merit consisted in their adaptation to artistic manipulation and adornment, had been expended on well-selected virgin properties such as I know of in this State, and could supply if required, ample success instead of deplorable disasters would have accrued in nine cases out of ten. If no respect is paid to the geological formation and constitution of a district, the lay, structure, and composition of its rocks, the mineralogical character of its lodes, their size, strike, and dip relative to the planes and cleavage of the rocks, the cross-courses, slides, dykes, &c., whether of sedimentary or igneous origin, by which a specific mineral concession or section is or is not pervaded, it is not to be wondered at that vast sums are annually wasted on abortive efforts at mining, nor that this paramount industry should have incurred the odium of a hap-hazard pursuit. I have devoted much time and attention to the several phases of mining in this State of Nevada, and am led to the conclusion again and again from whatever point of view I investigate the subject that its greatest mineral wealth with but one exception—the Comstock lode—has scarcely yet been touched. There can be but one opinion in the estimation of competent persons respecting the product and outcome of such properties as I refer to here. They depend not on a single feature, but a concatenation of the most favourable and appreciated features constitute their entire embodiment. It is next to impossible to err in respect of such properties, especially in this case when the risk is reduced to a minimum. No purchase-money is required, no land or surface damages to be incurred. I have two properties in the Mammoth mining district, Nye County, Nevada, of the maximum extent allowed by law, which I would give 30 years' leases of at 1-15th royalty, or one quarter of the profits, with no other proviso than that sufficient funds be provided and applied under competent local management to properly develop and realise their wealth respectively. The geological formation of the district and its mineralogical characteristics are unsurpassed, if not unequalled, by any district in the State, and all natural advantages of good roads; wood and water are abundant. When properties such as these can be had without a premium for a moderate proportion of their products it appears to me most unjustifiable to indulge in the luxury of expensive purchases of ill conditioned concerns. The process of time and development is frequently exaggerated into a bug-bear in opposition to such enterprises. Time and development in respect of mining as of many other pursuits are convertible terms, and apply to their every stage of progress and advancement. The old adage—"the more haste the worse speed" is too frequently overlooked, and a bound secured at a leap too frequently denotes the end of progress. If years of time are involved in the prospecting operations of a mine years of uncertainty must of necessity prevail, agitated by the fluctuations of hope and doubt which respectively may be influenced by trivial incidents. But the properties I am referring to are happily

exempt from such objections. Sufficient prospecting work has been done to demonstrate their value, so that months instead of years is all that is necessary to secure ample returns and inaugurate a career of continuous prosperity. The necessary machinery provided, one of the mines I refer to would pay from the start, and open up as developments progressed comparatively illimitable wealth. The other I believe to be equally valuable, but is not yet so deeply developed. The question now is are properties like these—of unquestionable merit—any attraction to *bona fide* investors, or is merit, unless presented in exaggerated fanciful forms, unmeritorious and devoid of influence. I shall be glad to treat with responsible parties for their proper working on the terms I have stated. ROBT. KNAPP.

One, Nye County, Nevada, Aug. 3.

BRITISH MINING ENTERPRISE IN BRAZIL.

SIR,—We move so slowly in this country, especially in mining affairs, I can give you this month but little news. We have only to read the *Journal* for encouragement under adverse circumstances, as no matter how bad the situation is some one shareholder or director like Mr. F. Tendron, of the St. John del Rey Company, will address the meeting and state that he has full faith in the mine. Mr. Tendron does not forget that he told the shareholders of that company not a long time ago that he knew the St. John del Rey Mine, and it was magnificent. I think they have since that statement was made paid two 5 per cent. dividends, and have lost of their reserve fund some 30,000*l.*, and I fail to find in any statement or report what has become of the money. The Morro Velho Mine, as I have repeatedly stated for three years past, has been failing, and the amount of gold per ton of ore is still falling off, as you can see by the monthly statements. The management is bad enough, but it is London management, and they are hastening the death by continual shipments of machinery. It has never been their method to consult the superintendent as to what machinery or men were wanted. Elephant stamps and other things sent on, and costly machinery put up at Cuiba contrary to the most emphatic advice of the superintendent. The superintendent has never since I have known of the affairs here had the selection of his officers and men. Mr. Fell and Mr. Hurry were, I am told, friends of Mr. Tendron's. Mr. Morris, who has just been discharged by the superintendent, Mr. Oldham, came down with machinery that cost about 6000*l.* laid down here, so he says, and I think he has fairly done the company. I have twice before expressed an opinion on this tailing business. I have seen Mr. Morris and a host of others trying the same work in California and Nevada. I do not know of one who has made money for the company, or more than a living for himself, although it is said that Mr. Morris had a better job with the St. John del Rey Company. Mr. Morris says that Mr. Oldham shall go if he (Morris) goes, so there is a general mess or muss. Mr. Oldham is a capable, careful, competent man, and there must be or should be one head manager. In this case it would seem that there are two; but we have yet to see if the London board arranged it or if Mr. Morris had lived so long in the United States that he could not fall into the English system of business. I estimate the tailing results exactly the same if he goes or remains. I did think that a few more small dividends would be saved for the St. John del Rey shareholders, but of this I am now very doubtful. It will be a long time before they get the new wheel in place; then they want more water, which can be had only at great expense, and the reserve fund is fading fast. They have not water enough to run the machinery which is now lying around the place. Cuiba with very close economy might keep about even, but if it is to be managed in London it will fast run in debt.

An adjoining property to Morro Velho has been purchased by the parties who are opening the Raposos Mines, and a Government survey will be made to ascertain the exact boundary line which the records show runs very close to the Morro Velho Mine. The same parties have bought the Morro das Bicas property which lies on the other side of the Rio das Velhas. In the prospecting adit of the Raposos Mines a shoot was cut and run through 36 ft. on the course of the lode, and 6 ft. wide. The ore worked out 7 oits. per ton at the mill; produce of 360 tons worked by six stamps was 2500 oits. Surveyors are at work near Raposos marking out the line of the railway, and the first posts are set for a line of telegraph north from Ouro Preto, or north-west on to Diamantina. The line passes Passagem and Marianna. I expect soon to hear of the usual big thing in London, as some persons—one said to be an engineer from an address as given me, Messrs. Johnson, Walker, and Co., of Aldersgate-street,—have been to look at the old Morro St. Vincente Mine, which caved in about the time it was abandoned. At Ouro Preto the interpreter stated that they were buying a line of mining properties, 15 or 20 more or less, and it required but a favourable word from the engineer to secure all the money required. As a specimen of the way they managed business here at Ouro Preto, they called on a gentleman who owns a mining property three hours' ride distant, and urgently wanted his power of attorney to deal with the property for three months' time, assuring him positively that they could remit the money promptly. The owner suggested that they visit and examine the property. No; they said that was not necessary—they knew all about it, having heard of it through others. They got the power to sell, but they had no time to visit the property. I hear that they took power to sell a prospect near Morro St. Vincente. Some specimens of the ore had been assayed at the School of Mines, and assayed 86 oits. per ton.—Ouro Preto, Aug. 3. MINAS.

SPECULATIVE MANIA—WHAT NEXT?

SIR,—That capital is over-abundant and wanting an outlet is too well known. The Indian gold mining mania, for which about 5,000,000*l.* will have been paid mostly by the British public for the purpose of testing the gold bearing capacities of the so-called reefs in Southern India, is more likely now than ever to end in disappointment and disaster. The electric light and power business has also contributed to the same thing. The public will have to pay the penalty for having been so rash in running headlong into these concerns, and the money expended, amounting to probably 12,000,000*l.*, which they have subscribed, will have gone towards proving an experiment as to whether electric lighting at its early stage of development would prove a commercial success. As it was with the railway system in the time of the great railway king, Hudson, millions and millions were subscribed before the system had been in any way properly developed, and thousands of families were ruined by being too hasty. In the present state of things, when we consider the great stagnation of business for the reasons above stated, and the superabundance of capital lying idle only waiting for an outlet, it is to be hoped, for the good and welfare of the community, that some trustworthy channel will be opened up, and that speedily, else some other more novel and enticing scheme or bait may shortly be introduced, even far eclipsing the Indian gold and electric light.

If we only look around and take a cursory glance we shall see that notwithstanding these great drawbacks which have so damped the ardour of enterprise, some undertakings are being pushed forward, which have now commenced to make large profits, and others on the point of so doing. We shall first commence with the Chontales Gold Mine of Nicaragua. For years past they have been driving a deep adit to intersect the Consuelo lode, which was reported to be very rich. Not very many months ago the shareholders were appealed to for fresh capital to continue this great work, which was responded to, and not long after their pluck and energy was rewarded. The adit intersected a rich gold vein, and immediately after instead of large monthly losses they commenced by making a profit of 700*l.* on the month's working, which has now been increased to upwards of 1200*l.* a month, or at the rate of from 14,000*l.* to 15,000*l.* a year; all the last money subscribed to attain this result has been returned to the shareholders. The company has issued neither debenture or preference shares, and the discovery is likely to prove great and lasting, and to occupy a conspicuous place in the annals of gold mining in South America.

Let us turn to the Pyrenees. English capital and enterprise is opening up the vast hidden mineral wealth known to exist here. The Sentein Silver-lead and Zinc Mine at the base of the Pyrenees, near Arriege, France, is now proving itself to be as first represented, and with a slight rise in the price of lead and spelter would pay very

handsome dividends. The monthly returns of marketable silver-lead now averages 140 tons, and of marketable zinc 400 tons, or nearly double the monthly returns of last year. Even at the present price of these metals this property under its present management may shortly enter the Dividend-List again. The Pierrefitte is another very rich silver-lead and blende mine in the same district, worked by English capital, and which is making large monthly profits.

In Venezuela English enterprise is rapidly testing the gold-bearing capacities of the veins in this district. Mining grants are being eagerly sought after, and those companies which first started on the field, such as New Callao, West Callao, and Callao Bis have a bright prospect, as the gold discoveries made here are not mere phantoms like the Indian Gold, as the El Callao Mine in the same district is one of the richest for the production of gold in the world.

Coming home—if we turn our attention to Cornwall—we are pleased to notice the splendid prospects of some of the mines. Take Prince of Wales. They have been indefatigable here for many years in pushing forward certain points in the confident expectation of meeting great results, and from present indications they appear to be on the very eve of cutting into a continuation of the same rich deposit which yielded such large returns and profits in the workings above. The great success of the Wheal Kitty and several other Cornish tin mines within the last year or two, where fortunes have been made, ought to be a sufficient encouragement to capitalists to foster and encourage this class of enterprise, and under good and persevering management there has been of late years few blanks and many prizes. Another likely prize is the New Terras Tin Mine, near St. Austell. All the well known tin mining experts who have inspected the mine state that it is one of the best in Cornwall, and several estimate the value of the reserves at upwards of 1,500,000. Stamping machinery has been erected, and tin sales will immediately commence. The mine is looked on by some as a second Dolcoath or Wheal Eliza, which latter is also near St. Austell, and has paid as high as 100 per cent. in dividends. SADLER AND CO.

Plymouth, Aug. 28.

SELF-ACTING MINERAL DRESSING MACHINERY.

SIR,—Knowing that you are always ready to insert in your widely-circulated Journal anything that may contribute to the better working of our mines by labour-saving appliances, I beg to submit a few extracts from a report made by the Asia Minor Mining Company and their consulting engineer, Mr. Samuel George, of Redruth, Cornwall, and Messrs. Arthur Levy and Co., on the Green's patent self-acting mineral dressing machinery. The merits of this machinery are well known in most of the metalliferous mining districts of the United Kingdom, having obtained the First-class Medal at the Royal Cornwall Polytechnic Society in 1876, and while doing excellent service at many mines in the home districts, which without them would have had to be abandoned, they have recently been introduced to Asia Minor with most satisfactory results. The directors of the Asia Minor Company, under date of July 23, 1883, report as follows on the merits of Mr. Green's machinery:—"We would especially point out for the information of the shareholders the success which has attended the ore dressing operations of this company, the returns during the last six weeks having averaged upwards of 10 tons of dressed silver-lead ore per day." Capt. George, having just inspected the mines and machinery, writes under date of June 26:—"The machinery of the dressing-floors is working well, and the separation is good in every respect." Under date of Aug. 27 Messrs. Arthur Levy and Co. (Mr. Levy being Chairman of the Asia Minor Company) say:—"We have great pleasure in informing you that the dressing machinery supplied by Mr. George Green, of Aberystwith, has proved highly satisfactory, the daily results being 10 tons of dressed ore out of extra hard and difficult ore-stuff."

It should be added that all of the above referred to machinery was made in light sections suitable for animal transit, the mines being in one of the most mountainous districts of Asia Minor, and, practically speaking, inaccessible by any sort of ordinary road. The ores of these mines are rich in silver, and are also strongly impregnated with sulphur, which makes the separation very difficult, and almost impossible by any other class of machinery now in use. With Green's improved machinery, however, this difficult process is most satisfactorily and thoroughly accomplished, and that by a self-acting process by which quite two-thirds of the manual labour attending any other process is saved.

At a late meeting of the members of the Mining Institute of Cornwall there appeared from the report in the *Mining Journal* to be some difference of opinion as to whether the jigging process, as applied in Mr. Green's process, was economically applicable to tin ores. I also note that Capt. Southey says in the *Journal* of July 28 that "the present mode of treating minerals in Cornwall is a disgrace to all mining both in efficiency and economy, and that thousands upon thousands of pounds per annum are squandered in this direction."

It seems strange that a process which is so successfully applied to the separation of ores, attended with all the difficulties that may possibly belong to the separation of tin ores, has not been utilised for that ore; but I feel certain that if the process to which I refer was applied to the dressing of tin, the great waste now going on in tin mines, according to Capt. Southey, would be saved, to say nothing of the saving in labour which Mr. Green's process would ensure. That proper attention to the economical and efficient treatment of metalliferous ores may do a great deal to relieve the pressure from which mining industry is at present suffering, no one can doubt.

Aberystwith, Aug. 29.

JOHN DAVIS.

SELF-ACTING CLINOMETER COMPASS.

SIR,—There has recently been invented in Australia a self-acting clinometer compass, which, if it can be brought into the market at a reasonable price, is likely to be very generally adopted. It is a clinometer or altazimuth instrument, with an attachment for reading its indications. When used as a self-acting clinometer compass an automatic altazimuth instrument it registers within itself the degree of inclination and the magnetic bearing of that inclination at which it has been allowed for a certain time to repose. This internal registration of gradient and azimuth is such, that by inspection the clinometer compass may be replaced after removal in exactly the same position as to gradient and azimuth as that in which it previously reposed. The inventor is a gentleman residing at Hawthorn, Victoria.—Mr. Farie MacGeorge—and the instrument is the result of much thought. He provides a phial of glass or other non-magnetic material having at its lower end a transparent bulb or chamber containing a magnetic needle attached beneath a float of glass or other non-corrosive non-magnetic material, which needle is pivoted on a rod of light material passing downward through it and touching lightly the bottom of the hollow tube. This bulb is filled completely with any solid fluid such as a gelatinous crystallising or glutinous solution thick enough to form a firm jelly or mass on cooling. This needle buoyed up to the point of leaving the bottom is free to assume the magnetic meridian, while the solution is fluid, but is fixed in that position as it congeals. A contracted glass tube socketed in the neck of the bulb keeps the magnet-float from escaping, and while allowing for expansion keeps the bulb full of fluid, thus preventing the formation of bubbles or free surfaces in the liquid; which would impair the freedom of the needle. He makes the needle deep and narrow in proportion to its length, so as to give the utmost direction and defining power within the space it occupies. At the upper end of the phial is another bulb, from which descends another contracted pipe also socketed in the neck of such bulb, and completely filled with the solid fluid. In this fluid he immerses a floating plummet, either rigid or flexible between float and weight, which is so adjusted as to remain perpendicular, and lightly touching that which is for the time being the upper part of the bulb, whatever position the phial is caused to assume.

The spheroidal form of both the upper and lower bulbs prevents the plummet and magnet from touching the sides of their chambers, the plummet from its buoyancy, and the magnet by its weight seeking always the central part of the concave it touches. The phial itself is also nearly filled with the solid fluid, and thus keeps the air from entering the bulbs through the tubes, while at the same time receiving the surplus or supplying the defect of their contents. These bulb tubes may be either separate or joined in one, in the

position shown, so that accidental air bubbles will in being expelled be unable to pass out of one into the other.

Excepting the difficulty of manufacture he would prefer to join them in one. According to one modification of the invention the magnet float is placed in the upper bulb, and lightened so that it touches the upper concave and pivots there, while the plummet is placed in the lower bulb, is made slightly heavier, and rests on the bottom. According to another modification the magnet float is placed in the upper bulb, the connecting line between the float and magnet being either rigid or flexible, and the whole apparatus being delicately adjusted so that if the upper bulb only is visible, the said line will give the perpendicular, and the magnet the meridian by inspection. He still continues the sunken plummet in the lower bulb, and with the addition of a magnet as shown, the readings of which, with the perpendicular line shown will either check the indications of the upper bulb, or be available if only the lower bulb can be seen. Either of these forms may be used separately if desirable, or both conjointly. Mr. MacGeorge suggests various other modifications of the apparatus, but these will suffice to show the general character of the invention.—*Geelong, July 4.*

MAORI.

LONDON COAL SUPPLY WITH SCOTCH COAL.

SIR,—So much has appeared quite recently in the Press on this head that a few cursory remarks from the promoter may not be deemed devoid of interest. The London season of 1883, similar to the coal merchants' "lowest summer price period," has been of much shorter duration than usual, to which cause is to be attributed in a great measure the transitory delay in launching the proposed company. The highest Government authority in the United Kingdom states in the important work, *The Coal and Iron Industries of the United Kingdom*—"The coal field contiguous to one side of the Forth is the largest in Great Britain." The deposit on the opposite side of the river immense, the great distance from the Thames under existing system of transport being the cause of a greatly superior quality of gas coal (Cannel) being alone imported into London. The leading newspaper of the locality, consuming the largest quantity of Scotch house coal out of Scotland, quotes it at 1s. per ton higher than the excellent well-known Wigan coal. The most rigorous calculations show a net profit of upwards of 50 per cent. will accrue on invested capital from sales effected at 10s. per ton, or 6d. per hundredweight, delivered into consumers' cellars in London, steamers' bunkers, and ships for export, &c. W. J. THOMPSON.

Little Toner-street, Aug. 29.

THE NEW PATENT LAW.

SIR,—The Act to amend and consolidate the law relating to patents for inventions, registration of designs, and trade marks will come into operation Jan. 1, 1884. It repeals wholly or in part no less than 23 statutes, and by simplification of procedure and reduction of fees effects great changes. Although the Act provides for certain alterations in the existing laws of trade marks and designs, the following remarks are confined to the one subject of patents for inventions.

There has been no substantial alteration in the Patent Laws since the Act of 1852, although numerous bills have been introduced into Parliament by the various Governments and private members. The amendments now effected are to a very considerable extent those recommended by the Committee of the House of Commons in 1871. The main alterations effected as regards the law of patents are as follows:—

The Government fees on application for provisional protection are reduced from 5s. to 1s., and the Government fees for completing the patent for the first term (four years in place of three as at present) are reduced from 20s. to 3s., so that the patent will be granted for a term of four years for a sum of 4s.

There is no alteration in the amount of the subsequent payments for the extension of patents from four to fourteen years, but in place of paying the 50s. and 100s. duties in lump sums at the end of the third and the seventh year these sums are now payable at the option of the patentee either in one sum of 50s. at the end of the fourth year, and one sum of 100s. at the end of the eighth year, or by annual payments of 10s. before the end of the fourth, fifth, sixth, and seventh years; 15s. before the end of the eighth and ninth years, and 20s. before the end of the tenth, eleventh, twelfth, and thirteenth years.

Patents will be granted to the inventor jointly with others, but the inventor must in every case make a declaration that he is the true and first inventor. Applicants for patents may, if they so think fit, transact all their business with the Patent Office by post, and the various post-offices throughout the country are to keep on sale the stamped papers required in applications for patents. Each application for a patent is to be confined to one invention only.

The procedure on application is as follows.—The inventor must lodge at the Patent Office a declaration and provisional specification. These documents in place of being referred to the law officers for examination are to be referred to an examiner. This examiner's duties are to see that the provisional specification fairly describes the invention, and to see that the title of the invention sufficiently indicates the object of the invention. The examiner has also to report to the Comptroller (the officer at the head of the Patent Office) whether the application conflicts with any other unsealed application in the office.

The provisional specification having been approved the applicant must then prepare his final specification, and lodge it at the Patent Office within nine months from the date of application. This specification is again referred to an examiner, who has to ascertain that the specification is properly prepared, and is consistent with the provisional specification. This examiner, in the cases of provisional and complete specification, is to report to the Comptroller. If the applicant is dissatisfied with the decision in either case he can appeal to the law officers. If the complete specification is not accepted within 12 months from the date of application the application is to become void.

The patent is sealed after the final specification has been passed by the Comptroller. The provisional specification remains secret until the complete specification is filed, but after that both provisional and complete specification are to open to public inspection. Specifications may be amended by way of disclaimer, correction, or explanation. The Comptroller is to decide upon all applications of this nature, there being an appeal from his decision to the law officers. A very important provision is also introduced for the purpose of enabling the patentee to disclaim, by leave of the judge, during the progress of an action, and without stay of proceedings.

The Board of Trade has power to grant compulsory licenses in default of the patentee granting licenses on reasonable terms, and on proof that—

- The patent is not being worked in the United Kingdom.
- The reasonable requirements of the public are not supplied.
- Any person is prevented from working or using to the best advantage an invention of which he is possessed.

The jurisdiction of the Privy Council in cases of prolongations of patents is retained, but the almost obsolete power given to the Privy Council to confirm patents is not re-enacted.

The action of *scire facias* is abolished, but revocations of patents may be obtained on application to the Court. The right of the Crown to the free use of patented inventions is abolished, but the Crown is to be at liberty to use patented inventions on terms to be settled by the Treasury.

In all legal proceedings with respect to patents the Court may, and at the request of either party shall, call in the aid of an assessor.

Letters Patent may be granted to the personal representatives of deceased inventors. The clause of the Patent Law Amendment Act, 1852, by which the British patent lapsed with the expiry of any foreign patent of anterior date, is not re-enacted. The provisions as to the registration of documents at the Patent Office, the printing and publication of specifications, and the preparation of indexes and abridgments, are not substantially altered.

The Comptroller is to issue an illustrated journal of patent inventions as well as reports of patent cases, and is to keep this journal and complete specifications of all patents in force, on sale. Power is taken to join the International Union for the reciprocal protection

of patents, and when this is done the anterior publication of a foreign specification will not (for a limited time) affect the British application.

J. HENRY JOHNSON.

Lincoln's Inn-fields, Aug. 28.

MINING IN SOUTH AFRICA.

SIR,—In the *Mining Journal* of Aug. 11, under the head of Notices to Correspondents, I see the question asked whether the South African Syndicate were in a position to commence operations, but was surprised to find the question has not elicited any answer from some of your numerous correspondents, or some one interested in the matter. If this should come under the notice of anyone acquainted with the affair I should feel very much obliged if they would kindly give any information through the columns of the *Journal*.

Swansea, Aug. 28.

H. T.

LOW GRADE COPPER ORES IN ARIZONA.

SIR,—Between four and five years ago I directed attention to the then neglected copper deposits of Arizona, and stated:—"From the number and richness of the copper mines scattered through nearly all the new mining districts of Southern Arizona, although disregarded in the prevailing excitement for locating and speculating in mines of the precious metals, it is evident that before long they must assume their position as one of the leading industries of the Territory, and, as recently in Chile, rival if not surpass in importance the mining for gold and silver. Once Tucson shall be tapped by any of the rapidly approaching railroads, then mines will acquire a market value, and, already I am informed, some of our far-seeing mining men are taking steps to secure possession of a number of them with a view of establishing smelting or lixiviating works, or both combined, for the reduction of copper."

At that time copper was regarded by the prospectors as so utterly valueless that rich samples brought in from these claims, carrying 20 to 50 per cent. copper, were not considered to be worth the cost of assaying and recording unless they contained gold and silver in paying quantities. Two years elapsed ere this extraordinary apathy was overcome, notwithstanding the fact that the Longfellow Mines at Clifton had then been in successful operation for some years. The advent of the Southern Pacific Railroad and the wonderful developments in the Copper Queen Mine at last, however, opened the eyes of the Arizonians to their interests, and since that time copper properties have been sought for with the greatest avidity, and my prediction of 1879 fully realised, copper mines at the present moment being more in demand than those of gold and silver.

As might have been anticipated, the richest class of ores have been first to be operated on, and most successfully, through the facilities offered by the new water-jacket furnaces, notwithstanding the still high price of coke, which is almost if not quite entirely used as fuel; while the low grade ores are accumulating on the dumps, or left untouched in these mines now being worked, and hundreds of claims and locations that would pay handsomely by the wet or hydrometallurgical method of treatment are left unworked, because not rich enough to pay by the smelting process of reduction, which is much heavier on this class of ores than the richer kinds, more fuel and fluxes being required as the proportion of copper diminishes, and the gangue (generally silicious) increases. A point, therefore, arises when the smelting process ceases to be profitable at a percentage something between four and eight, according to local facilities and cost of fuel and fluxes, and recourse must be had to the wet method of reduction; it is to this very important subject I would earnestly direct the attention of all of your readers who may be interested in copper mining.

This mode of working has as yet made very little progress in this country, although it has made vast strides in England and other parts of Europe, more than four times the amount of copper having been produced in England by its agency during the last few years from native and imported ores, than from the entire produce of the once celebrated mines of Cornwall, and this is not to be wondered at when it is remembered that this immense product, in addition to the output of Spain and other places, is chiefly obtained from ores which do not contain more than from 2 to 3 per cent. of copper, and it is well known that the companies operating by this method are not only the largest but the most successful in this copper trade, one company alone dividing about \$1,000,000 annually amongst its shareholders. The cost of operating in places like Arizona will, of course be much greater than in England, but surely if 1 per cent. of copper will cover all charges for mining and reduction (as I know is the case in several establishments in the old country) 4 to 8 per cent. should leave a large margin of profit under the most disadvantageous circumstances in these kind of places, allowing liberally for high wages and increased cost of materials required for reduction.

The two best known systems of applying the wet process are known as the Henderson (or Longmaid) which is chiefly used in England, and the Hunt and Douglas, which has been in successful operation for some years to a limited extent in this country, at Phoenixville, near Philadelphia, and other places. In both of these methods the copper is precipitated from its solution by means of scrap iron; 1500 lbs. in the latter to as much as 2500 lbs. in the former, being required to produce 2000 lbs. of copper. As this iron is not recoverable, and in many places very difficult or expensive to obtain, a strong prejudice against the process has sprung up amongst many of our copper men who have only partially investigated the question, the difficulty of obtaining iron in sufficient quantity being an insuperable objection, and causing them to abandon all ideas of the wet process as impracticable. The application of a very little chemistry will remove this bugbear, as lime may very advantageously be substituted for iron in new localities where it is met with either in the mine itself or within a reasonable distance. In this case the copper will be precipitated in the form of black oxide, instead of the metallic state as with iron, which can be very readily run into, bar copper, at little, if any, more expense than the impure (sometimes as low as 60 per cent.) cement copper from the iron precipitation.

Tucson, Arizona, July 26.

W. T. RICKARD, F.C.S.

WEST KITTY AND TREVAUNANCE.

SIR,—In the multifariousness of my calling on Friday last I found myself at St. Agnes or St. Ann's (will someone kindly inform me why this place aspires to two names?), and a few days previous to my going there a friend of mine asked me, which, in many cases with regard to mines, would be nothing less than a miracle, to ascertain the true state of affairs at Trevaunance. I put my nag up at the Commercial Hotel (the Tabbs' of St. Agnes), kept by its enterprising and obliging proprietor Mr. Paul. After a draught of his famous home-brewed (the sun was hot, and the roads dusty) I sallied forth to find Capt. Vivian, the manager of Trevaunance and other mines—to wit, West Kitty. I rapped at the door of his unassuming office, and was soon ushered into his presence; being an entire stranger to him I naturally felt a diffidence in introducing myself, but in a moment I felt at home with him. Capt. Vivian has no superfluity about him in the shape of gas, as "bal cap'n's" as a rule have. He is a practical miner. In a few words I told him my mission, as I never could beat about a bush, perhaps this is a weakness in a miner, but this phenomenon is nothing to be wondered at, as I am informed as a race we are degenerating. Capt. Vivian courteously stated that he was just on the point of going to Trevaunance, and should be glad of my company. To that mine we hied, where we found them winding with a horse-whim; it appears with the exception of the vastly important cross-cut driving from Trevaunance to intersect the old Pink or Friendly lode, which runs parallel, the work is on tribute, and if the tinstone I witnessed being drawn from the tribute pitches is an omen of the future success of the mine, Mr. Reynolds has another rich prize at hand for his clients, as they are daily anticipating cutting the lode, and the ground indicates a near approach to it. The old Pink lode has returned 45,000s. profit, mark above adit, below which point it is virgin, as most of the lodes in the district are. This is not the only prospect appertaining to Trevaunance, which with the old Pink are flat lodes, and from the nature of their bearings hitherto it is not improbable that in depth they may affiliate. Should such prove the case Trevaunance may even vie with West Kitty as it realises in only three acres of ground 200,000s.

Notwithstanding, Mr. Reynolds has sufficient, and to spare, of wind to blow his own trumpet, he is to be heartily congratulated on the valuable properties he possesses in West Kitty and Trevaunance, and the energetic and minerlike manner in which the mines are being worked under the competent management of Capt. Vivian. West Kitty is a living witness of what perseverance in mining will accomplish. Capt. Vivian informed me that he had clung to the mine in adversity and otherwise, through no less than three companies; the fourth and present company are deservedly reaping a permanent and rich harvest. In mining, as in any other branch of commerce, "There is nothing succeeds like success," and this can only be attained by those of the same kidney as Mr. Reynolds. I also visited West Kitty where the tinstone was in process of spalling as it was drawn to surface. Here I was invited by Capt. Vivian to lift a solid piece of diamond tin near upon 2 cwt. The dressing-floors are exceptionally well constructed, and capable with additional machinery of getting through any amount of stuff in moderation.

The immense success attendant on the efforts of Mr. Reynolds at West Kitty ought to be a source of encouragement to those mining speculators who are still groaning, and sad to say in some cases damning over repeated calls. The antidote in mining is perseverance and dogged determination, or to-day where would West Kitty be, and many other dividend mines? W. NINNES.

Perranporth, Aug. 29.

THE WHEAL AGAR ACCIDENT.—SUGGESTED MEANS OF SAFETY IN WINDING.

SIR,—Referring to the appalling catastrophe at Wheal Agar on Aug. 15 permit me to make a few remarks thereon in the columns of the *Mining Journal*, and to offer some suggestions with a view to the prevention of similar accidents in the future. Whilst agreeing with the opinion which is sometimes expressed that workpeople are responsible, by their carelessness and recklessness, for many of the mishaps which occur to them, I am hardly prepared to admit without a qualification that the disaster at Wheal Agar would come under this category. It was stated by one of the agents at the adjourned inquest on Aug. 22 that there was no rule as to the number of men to ride in the cage; it depended on the size of the men, the usual number being from eight to ten. Of the poor fellows killed, five were mere lads, and only four were above 23 years of age, and the difference in weight between these and eight heavy men might not exceed 4 cwt., a bagatelle for a capstan-rope. The men who rode upon the top of the cage certainly exposed themselves to danger from falling stones, &c., and to being hauled up to the pulley at the top of the shaft; but the rope might have broken with a smaller number of heavy men, and whilst admitting that an excess in the number of men riding may have been the actual determining cause of the accident, the unsoundness of the rope was the primary cause.

I cannot help thinking that, as a rule, all is not done that might be done, for the protection of the lives of our subterranean toilers. The conviction grows in the mind, and will grow, unless the lessons now taught are laid to heart and acted upon, that the miner's life is not so fenced round with the enforcement of stringent regulations and the adoption of accident preventive appliances as the momentous character of the case demands. I understand the rope used on the occasion was the capstan-rope—a round steel wire one—and was about three years' old. The size has been variously stated from 3½ to 4½ in. in circumference. Assuming the former to be the correct size, it would, when new, have borne a tension of about 35 tons before breaking, and its fair working load would have been about 5 tons. The adjourned inquest elicited the fact that it had been used four days before the accident to lift 10 or 12 tons, and, previous to that, it was used under a strain of 20 tons, and that, without any examination worthy the name after such heavy strains, it was employed to convey miners to and from their work. It seemed to have been nobody's business to examine the rope; and, such was one of the agent's ignorance of its condition that he stated he would not have been afraid to trust it to take up 50 men. The rope was so coated with tar and grease that its true state would not be discernible by a mere superficial inspection. When examined after the accident several of the wires were found to be very badly corroded. Is it not astonishing that it should have been considered the best rope in the mine, and the agents had every confidence in it? A rope that, when new, should withstand a strain of from 30 to 35 tons, breaks at about 1-20th of that strain!

The chief means for attaining increased security in winding one would naturally suppose to be increased care in the selection and use of ropes, and the adoption of safety appliances. If from the peculiar circumstances of winding in Cornish mines safety appliances would not generally be practicable, as some imagine, much might be done to avert accident by careful attention to the first point—the rope and the circumstances attending its use, and it would not be too much to expect that some stringent regulations should be applied to this matter. A new rope on being brought into the mine should be critically examined by an experienced person and tested. It must not be forgotten that every test weakens a rope more or less; it should, therefore, only be tested in such a way as will determine its fitness for the work to which it is to be applied. Any excessive strain will leave what was before a fairly good rope a weak one. The pulleys over which it works should be of such diameter as would not injure it by over-bending, and care should be taken that it is not subject to abrasion underground in passing from perpendicular to underlay and vice versa. It should be frequently overhauled, and in order to a thorough examination, as Mr. Frecheville very properly pointed out, tar and grease should not be used, as they conceal defects. Oil should only be used, and the rope should be kept free from dirt. It should be the duty of a responsible and experienced person to perform the periodical examination, and the rope should be worked at its minimum working load, and as the rope gets older the load to be gradually and proportionately reduced, and before it has become weakened to anything approaching a serious degree it should be discarded and put to a less responsible use. I would suggest that on no account should a rope which is occasionally used for raising men be worked above a fair working load.

For extreme weights only the capstan-rope should be used. No winding-engine should be without an indicator showing the position of the cage at any part of the shaft; this I believe is very generally attended to. This would prevent, providing the engine is under due control, overwinding on the one hand and running out too much rope on the other. It is surmised that a twist or "kink" was caused in this way in the rope at Wheal Agar. Of course every intelligent miner knows all about such matters, but we want such knowledge carried into practice, and the enforcement of regulations which in too many cases exist only on paper.

I would urge as the next step towards increased security of life the introduction of safety appliances. Of these there are two general classes—first, detaching hooks for preventing overwinding; and, second, catches to arrest the cage when the rope breaks. As the accident in question was not due to an overwind a detaching hook would not have prevented it, as it only comes into operation when the cage, through neglect on the part of the engineman or a mishap to the engine, is drawn up to the pulley. Overwinding is not nearly so frequent in Cornish mines as in collieries, where the winding is very rapid, and a single stroke of the engine raises the cage 60 or 70 ft. The cage is the only means of conveying colliers to and from their work, except in a few instances, but in Cornwall it is the exception. The detaching hook is therefore not the vital necessity in Cornwall it is in the coal fields.

What is most wanted is an appliance that shall prevent the cage falling down the shaft when a breakage occurs in any part of the shaft or above the shaft. Appliances of this kind, termed "parachutes," are in use in the French and Belgian collieries, and in the mines of California, Nevada, and Colorado. To be brief, for your space forbids my dilating here, they generally consist of diagonally placed levers armed with sharp steel points, which penetrate the guides when the rope breaks, and so suspend the cage. I am not aware that they have been generally adopted in the British collieries. The safety cages of White and Grant are largely employed in Scotland; Owen's has been applied in many of the Lancashire pits, and has actually saved numerous lives. There are others in use, such as Aytoun's,

Ryst's, Jordan's, and Calow's. But the advisability of employing safety catches is generally an open question in the British collieries. The chief obstacles to their general adoption are their tendency to come into operation when not required, and their failing to act through rust and dirt, the whole concern becoming fixed from disuse. It is commonly urged that the use of catches begets carelessness in the men, and many prefer trusting to the use of good ropes, and their frequent careful examination and close attention to all parts of the winding apparatus. I cannot do better than quote from Blake's *Mining Machinery*, pp. 122 and 126, on this point. I think his remarks are well worth the further demand on your space.

"Although the construction of parachutes has not by any means reached perfection, there being some difficulties attending their use, they have rendered the greatest service in mining operations, repeatedly preventing great losses of life and property; and no excuse can be received for allowing a single mining cage to be without one wherever miners are permitted to ascend and descend in it. Accidents from the unaccountable breaking of the strongest cables are not infrequent, and when it is well known to mining engineers that parachutes of the proper construction have repeatedly been the means of saving life, it is strange that there should be any hesitation in adopting them."

"All parachutes combined and constructed on this principle have given satisfactory results, and it may be said that, if the security obtained is not complete and absolute, they have, nevertheless, rendered such great services that their application has become a question of humanity which cannot be ignored. . . . At the mines of Anzin, from 1851 to 1859, in 14 shafts supplied with parachutes 29 cable ruptures occurred, and the parachutes saved the lives of 150 men. What can be more eloquent and more persuasive than this fact?"

I am aware that the circumstances of winding in Cornwall differ very materially from those in collieries and in America, and it is probable that none of the forms of safety appliances referred to would be practicable, but surely with so much inventive genius in the country something might be done to meet the case. Human life is too precious to be dependent upon the strength of a rope however apparently good, if it can be supplemented by a contingent protective appliance. I would suggest that a premium be offered under the auspices of the Royal Cornwall Polytechnic Society, the Miners' Association and the Mining Institute for the best appliance specially applicable to Cornish mines. If this were taken up heartily and the movement supported by the mines, such a premium could be offered as would set the most ingenious engineers and miners at work all over the kingdom, or the world for that matter. The students of the Miners' Association might be encouraged to make the matter a study by the offer of a prize for the best essay.

Hayle, Aug. 30.

S. MICHELL.

[In accordance with Mr. Michell's suggestion, the Editor of the *Mining Journal* will have much pleasure in offering a prize of 5*l.* in books to be selected by the winner, for the best essay written by a student of the Miners' Association of Cornwall and Devon, or by any working miner actually employed in a mine, upon condition that Mr. Robert Hunt, F.R.S., Mr. R. J. Frecheville, H.M. Inspector for Cornwall, &c., and Dr. Clement Le Neve Foster, H.M. Inspector for North Wales, will undertake to act as judges in the competition. The essays to be sent in for competition not later than Nov. 1, and the Prize Essay to be published in the *Mining Journal* as soon as the prize is awarded.]

MINING NOTES AND RECOMMENDATIONS.

SIR,—In a former letter I referred to the terrible state of roads in the Gold Coast from Axim to Tacquah, and from the information I have been enabled to gather from official document, the state of those roads is likely to continue the same, unless some pressure is brought upon the authorities. From March, 1882, to July, 1883, the noble sum of 20*s.* had been spent out of the Colonial Treasury to remedy the evils, which have caused so much expense, loss of time and goods to the mining companies in West Africa. No doubt the directors of the several companies owning mines have brought these facts under the notice of the Colonial Secretary, although there appears to be no reference to them in his communication to the Coast. At the Gold Coast these things have been brought under the notice of the Governor; but there seems to be an almost unpardonable dilatoriness in carrying out the works. The colony is making fair progress and has discharged the naval and military costs incurred in 1881 under the apprehended war with Ashanti—the golden axe period, which your readers will remember. The strain on the resources being removed, and the time of the officials less occupied, no doubt we shall be hearing of improvements before long. Of the necessity of them there can be little doubt. Commander Rumsey in his report says:—"While on the subject of accommodation, I may remark that it is extremely difficult to get supplies to this part (Tacquah). The people are not agricultural, but are employed almost entirely in gold washing and mining; it is seldom that a sheep is seen, and even fowls are scarce. Europeans are, therefore, entirely dependent on supplies of preserved provisions to be brought up from the Coast. The mining companies, of course, have their Kroo-boys available for this as carriers and boatmen; but the Government officials must either hire carriers at an exorbitant rate (as they are difficult to get), or else must be dependent on the courtesy of managers or agents (of mines), who, however willing, must at times be quite unable to undertake more than their own transport." Mr. Jones, assistant surveyor, confirms this in these words:—"Carriage of a case of provisions, Axim to Tacquah, 40 lbs. weight, costs Civil Commissioner 15*s.*, and but for the courtesy of the different mining agents many privations would have to be incurred, or large expenditure made, by the officer in charge of station." So that instead of the Government doing their duty in making good roads for the benefit of officials and mining companies, the latter have at different times spent large sums on road-making, and, inferentially, been put to "a large expenditure" on behalf of the Government. What advantage the station is to the mining companies under these and other circumstances, to which I shall refer, it is difficult to see.

The population of the Gold Coast is traditionally said to be 400,000; and, considering the state of civilisation—the imports 398,000*l.* and the exports 373,258*l.*—assume considerable importance, and augur well for the future. In 1881, the year to which these figures apply, 12,121 ozs. of gold dust, valued at 43,636*l.* were exported, reckoning it at the coast price of 3*l.* 12*s.* per oz. The mines at this time produced nothing; indeed, returns are only now beginning to be made, and regular returns are expected from the Gold Coast Company after October. In one of the Government reports it was stated that these returns might soon be expected, and in reply to this intimation Lord Derby wrote to the Governor that as "countenance and protection" had been shown to the mining companies they should make a direct contribution to the colonial revenue. Unfortunately, in January last a European employed at the Tacquah Mine was murdered in bed by some of the natives. Four men were found guilty at the coroner's inquest, and at the close of it the jury handed in a protest to the effect that the Government had not given any real protection at Tacquah. Europeans not being allowed to protect themselves, the only remedy the Tacquah district had, being a long

and costly journey to Axim or Cape Coast Castle, even for the most trivial offence. The consequence was the natives had become audacious, "culminating in the murder of Mr. Barrow." Dr. Roulston, who acted as coroner, says, "I must say that in consequence of the Europeans being obliged to allow them to escape punishment for minor offences they have become audacious and insubordinate." A correspondent of the Aborigines Protection Society writes that "the natives have been brutally treated, kicked about, and often had revolvers pointed at their heads when they demanded their wages." There were but few Europeans on the spot, so that if this were true it could easily be ascertained who were the guilty parties. But it seems the evidence is against this statement. Dr. Roulston and twelve Europeans are of opinion that the evils have begun in the want of a magisterial executive. But it is premature for the Colonial Office to suggest taxation on the ground of "countenance and protection," when neither the one nor the other has been given. The better way to tax, if it must be done, would be to construct a good road and fix a toll or rent for the use of it, until times would admit of its being commuted for a direct duty. E. R. GABBOTT.

CORNISH MINING—TRESAVEAN MINE: ITS PAST HISTORY AND PROSPECTIVE VALUE—THE IMPORTANCE OF CROSS-CUTS.

SIR,—The hidden treasures of the earth only become developed through perseverance, scientific skill, and the practical expenditure of money. The mines comprised within the limits of Tresavean sett produced in 70 years the vast amount of 1,688,589*l.* These figures of produce prove increasing discoveries of mineral from extended development. It is on this ground, combined with my own practical knowledge of the Gwennap district, and more recent acquaintance with the underground workings of the mine in question, that I strongly advocate the extension of cross-cuts to lay open such a mine of wealth as shall compare favourably with the most productive mine ever discovered in the county. I am confirmed in this from an examination of the working plan made by the late company's agents, and more particularly from a report of the mine which I have before me made by the late celebrated Capt. W. Martin in the year 1858 who winds up an elaborate report thus—"The Old Lode.—When it is considered that this lode is standing in whole ground, all to the west of old east shaft, 300 fathoms in length and 200 fathoms in height, it will puzzle the imagination to calculate the results. Suffice it to say that it is quite evident the old lode is standing south, not only by the proof of the cross-cuts intersecting it 20 fathoms south of the old levels, but also by levels driven on it for a short distance where it went off from the old workings, and the quality of the ore is so different and superior to any of the ore on the north lode. There are thousands of fathoms of ground standing; with a little outlay in arrangements immense quantities of ore could be raised and become increasingly remunerative." It would seem from this and other proof that another epoch in the history of this great mine is in prospect. The copper ore being raised from the discovery at the 100 fathom level shows convincing proof of the correctness of the report given by the late Capt. W. Martin as far back as 1858, and that a short time is only necessary to again gain for Tresavean a world-wide celebrity.—*St. Day, Scorrier, Cornwall.* C. BAWDEN.

IMPORTANT PROJECT TO FURTHER DEVELOPE THE CUMBERLAND COAL FIELD.

SIR,—A company influentially connected with the iron and coal trades of the county, it is currently reported, is to be formed to further test the Cumberland coal field to the north of the existing pits. It is now supposed that an immense coal field underlies the new red sandstone. The present northern workings of Aspatia, Brayton Domain, and Bolton Colliery, of the Maryport Hemson Company, also Allhallows Pit, Mealsgate, of the Allerdale Coal Company, are bounded by the new red sandstone, which is put in by the great downthrow fault. This fault has recently been reached by the extensive pits of Brayton Domain, and will, in all probability, be found further north by east at Allhallows. It is not improbable that there is an immense undeveloped coal field lying between the present extreme northern workings of Mealsgate, and extending for miles north and east to Carlisle and Brampton, and into Scotland, joining the Cannobie coal field.

Some few years ago the Earl of Lonsdale (Whitehaven Collieries) had extensive trials made to prove coal at St. Bees that was thought to underlie the St. Bees or new red sandstone that was thought for years to the extreme south that the Cumberland coal measures would be met with. However, the successful issue was proved, and the coal seams were found in perfection underlying the new red sandstone. This fact, together with the great fault having been reached by the Brayton Domain Colliery Company on the northern field, has given the impetus to a trial being made, and a company will in all probability shortly attempt to prove coal in the extensive royalty of Lord Leonfield, near the Solway Junction Railway, embracing thousands of acres. The influence upon the Solway Junction Railway, Maryport and Carlisle, Cleator, Workington Railway will be great in the event of the success of the work. The position would point out the desirability of blast-furnaces, as there would in all probability be hematite iron ore at no great distance eastward. Limestone is found in immense quantities, and the Siloth Docks are near at hand. Upon the whole, the project is one of great importance. W. WILSON BARNES.

TREGEMBO MINE.

SIR,—Kindly allow me space for a few remarks on the above mine in the *Mining Journal*. It is now two months since the meeting of the adventurers, but I cannot discover that any tin sales have taken place, and I have read the agents' reports as they appeared in the *Mining Journal*. At the meeting the shareholders were under the impression that 20 tons of tin per month would be returned; this impression was shared in by the Chairman particularly. We were told that "the tinstuff so far had yielded 50 lbs. of tin ore to the ton of stuff, and as the stamps were treating 30 tons of stuff every 24 hours, 22 tons of tin per month would be the result." After this cheering statement, how is it that tin sales have not been reported? Distant shareholders have a right to ask; to them the information is invaluable.—*Truro, Aug. 29.* C. B. R.

STEEL COMPANY OF SCOTLAND.—The directors' report to the shareholders for the year ended July 12 states that the profits of the year amount to 80,908*l.* 0*s.* 5*d.*, from which fall to be deducted—depreciation, 17,000*l.*; interest, 15,525*l.* 14*s.* 6*d.*—32,525*l.* 14*s.* 6*d.*, leaving a balance of 48,382*l.* 5*s.* 11*d.*, which, with 3686*l.* 0*s.* 8*d.* from previous year, gives 52,068*l.* 6*s.* 7*d.* to be disposed of. The directors have decided to add 5000*l.* to the reserve fund, which will then amount to 13,000*l.* From the balance of profits they recommend that 43,612*l.* 16*s.* be appropriated to the payment of a dividend on the paid-up capital of 11 per cent., free of income tax, payable one-half on October 9 and the other half on April 9 next; the balance, 8455*l.* 10*s.* 7*d.* to be carried forward.

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Registration of New Companies.

The following joint-stock companies have been duly registered:—

WEST LONDON ELECTRIC LIGHTING COMPANY (Limited).—Capital 60,000*l.*, in shares of 10*l.*. The usual business of an electrician, chemical, and mechanical engineer. The subscribers (who take 25 shares each) are:—D. Lock, 3, Warwick-road; M. Lucken, 3, Cleveland-row; G. Elliott, 1, Park-street; P. Rawson, Crawley; G. W. Campbell, 22, Queen's-gate Gardens; J. E. H. Gordon, 28, Collingwood-place; L. Hoersheim, 4, Bank-buildings.

THE WESTERN DISTRICT TRAMWAYS COMPANY (Limited).—Capital 100,000*l.*, in shares of 10*l.*. To construct, equip, maintain, and work tramways. The subscribers (who take one share each) are:—R. L. Cosh, Chiswick; W. Brough, Shepherd's Bush; W. G. Colley, Hammersmith; J. Ringwood, Hammersmith; W. B. Salmon, 33, Netherwood-road; J. Goulding, Shepherd's Bush; T. Seymour, Shepherd's Bush.

GENERAL LOAN DISCOUNT, LAND, AND MORTGAGE COMPANY (Limited).—Capital 100,000*l.*, in shares of 1*l.*. The business of finance, loan, and investment agents. The subscribers (who take one share each) are:—W. Felton, Poplar; P. B. Hooff, Woodford; J. W. Burrows, Stoke Newington; H. W. Filkin, Camberwell; F. A. S. Bella, Clapton; W. Reynolds, East Dulwich; J. T. Rolfe, Stratford.

THE METROPOLITAN FREEHOLD LAND COMPANY (Limited).—Capital 300,000*l.*, in shares of 5*l.*. The usual business of a land company and building society. The subscribers (who take one share each) are:—E. Reynolds, Barnes; A. C. de Boinville, Leominster; W. M. Robbins, Ilfracombe; C. A. de Boinville, Kingston-on-Thames; J. Gaskell, Chippenham; M. Bradford, 70, Queen Victoria-street; T. Preece, Stamford Hill.

HANLEY AND BUCKNALL COAL COMPANY (Limited).—Capital 75,000*l.*, in shares of 5*l.*. To carry out a contract made with the official liquidator of a company being same name, for the acquisition of certain coal mines, collieries, railway plant, machinery, and effects belonging to said company, and to carry on the business of colliery owners, miners, and coal merchants, &c., in all branches. The subscribers (who take one share each) are:—J. F. B. Greenfield, Saddleworth, coalmaster; A. Buckley, Ashton-under-Lyne, coalmaster; J. Dugdale, Burnley, merchant; E. W. Milne, Chesham, accountant; J. Radcliffe, Rochdale, cotton spinner; J. Radcliffe, Wetherby, cotton manufacturer; R. Winstanley, Manchester, M.E.

JOSHUA BUCKTON AND COMPANY (Limited).—Capital 100,000*l.*, in shares of 100*l.*. To acquire and take over the Well House Foundry in Meadow-lane, Leeds, and continue the business in connection therewith. The subscribers are:—J. Buckton, Leeds, 140; J. Hartley, Leeds, 100; W. W. Lupton, Leeds, 100; T. A. Carpenter, Leeds, 50; W. Buckton, Leeds, 50; W. E. Oates, Leeds, 40; C. G. Oates, Leeds, 40; G. W. Brown, Leeds, 40; J. Lupton, Leeds, 40; N. Lupton, Leeds, 40.

THE BOUNDS GREEN ESTATE (Limited).—Capital 25,000*l.*, in shares of 1*l.*. To acquire an estate situated at Tottenham, and carry on a land company's business in connection therewith and that of a building society. The subscribers (who take one share each) are:—B. C. Cowan, 5, St. James's square; R. Vokes, Hull; C. G. Picking, Wood Green; C. H. Partington, Stoke Newington; J. H. Neck, 65, Leadenhall-street; W. C. Aevnell, King Henry's-road; S. W. Flammank, 29, King Henry's-road.

THE REFORMA GOLD MINE (Limited).—Capital 6000*l.*, in shares of 1*l.*. To acquire by purchase or otherwise lands, estates, mines, mineral grants, mining rights, and privileges, ores, minerals, &c., in the United States of Colombia, South America, or elsewhere, for the purpose of exploring, developing, and maintaining the mines and other properties belonging to the company, carrying on all kinds of mining operations, and to purchase and erect all necessary machinery, plant, &c., that may be required. The subscribers are:—F. Hunt, Stock Exchange, shareholder, 500; G. Vicars, Leicester, merchant, 200; H. T. Sankey, Canterbury, solicitor, 500; S. Steele, Strood, gentleman, 100; J. T. P. Pechey, 59, Mark-lane, merchant, 500; S. A. Cobbett, 10, Blomfield-street, secretary, 100; S. A. Went, gentleman, Thames Ditton, 100. The board consists of the following:—H. T. Sankey, J. T. P. Pechey, and C. O. Rogers, the qualification being fixed at 200 shares.

THE USK SHIPBUILDING COMPANY (Limited).—Capital 20,000*l.*, in shares of 10*l.*. To carry on at Newport (Monmouthshire), or elsewhere the trades of shipbuilders, shipowners, engineers, &c. The subscribers (who take one share each) are:—T. Baker, Cardiff; J. Fry, Penarth; C. M. Jacobs, Cardiff; G. Baker, Cardiff; L. G. Lawrie, Newport; T. E. Watson, Newport; J. W. Popman, Cardiff.

THE UNIVERSAL PRINTING COMPANY (Limited).—Capital 10,000*l.*, in shares of 500*l.*. The acquisition of certain patents and the usual business of printers, lithographers, engravers, designers, &c. The subscribers (who take one share each) are:—S. E. Voight, 34, Fenchurch-street; E. Johnson, 24, Mark-lane; C. F. A. Romanal, 3, Moorgate Buildings; F. Eiseulohr, 21, Mincing-lane; J. C. Geiselbrecht, 8, Leadenhall-street; P. Goldschmidt, 59, Mark-lane; A. Bencke, 62, Bishopsgate-street.

ENRIQUE CORTES AND COMPANY (Limited).—Capital 70,000*l.*, in shares of 100*l.*. To acquire and carry on a financial business, late of 41, Seething-lane, and now of Eastcheap Buildings, in the City of London. The subscribers are:—E. Cortes, 25, Colville-terrace, 120; R. Parga, 7, Manchester-square, 54; C. Matts, Dalston, 1; R. P. Castilla, Paris, 160; F. Noguera, Paris, 80; N. Eguena, 7, Manchester-square, 80; A. Noguera, United States of Colombia, 80.

THE GROVE TINNING COMPANY (Limited).—Capital 100,000*l.*, in shares of 1*l.*. The business of tinned ware and tin-plate manufacturers in all branches. The subscribers (who take one share each) are:—T. B. Bradfield, Clapham; W. B. Pike, Devonshire-place; H. A. Welman, 45, York-street; C. Fox, Mortlake; W. Holloway, jun., Woodford; C. L. Marsh, 1, Atherton-street; M. W. Bristow, 125, Elaby-road.

THE CADOXTON JUXTA BARRY LAND AND BUILDING COMPANY (Limited).—Capital 20,000*l.*, in shares of 10*l.*. The usual business of a land company and building society in all branches. The subscribers (who take one share each) are:—D. Jones, Cardiff; J. P. Jones, Cardiff; G. S. Stowe, Cardiff; W. Jones, Cardiff; R. L. Stowe, Penarth; H. Jones, Cardiff; D. Jones, Cardiff.

CLEGG AND SON becomes incorporated under the Limited Companies Liability Acts.

The South Hylton Iron and Steel Company, on Thursday, decided to wind up, and Mr. John Edey, chartered accountant, was appointed liquidator. Messrs. W. F. Clegg and Sons are the solicitors in the matter.

Capt. H. Harvey, of the Phoenix United Mines, has been appointed manager of a gold mine in the Transvaal, and will sail for that country at once. He has been an agent in the Phoenix United Mines upwards of 12 years, and has won the esteem of a large number of friends in the Caradon district.

CORNISH PUMPING-ENGINES.—The number of pumping-engines reported for July is 14. They have consumed 1859 tons of coal, and lifted 12½ million tons of water 10 fms. high. The average duty of the whole is, therefore, 45,400,000 lbs. lifted 1 ft. high by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Dolcoath—85 in.	Millions	55.0
West Tolgus—Richard's 70 in.		47.4
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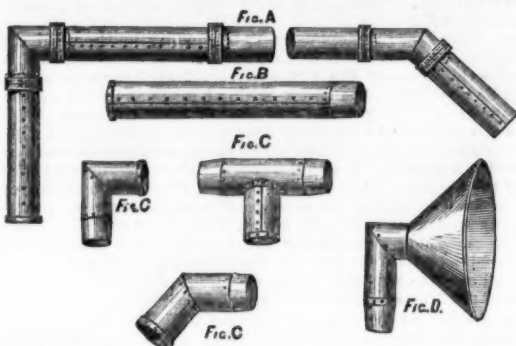


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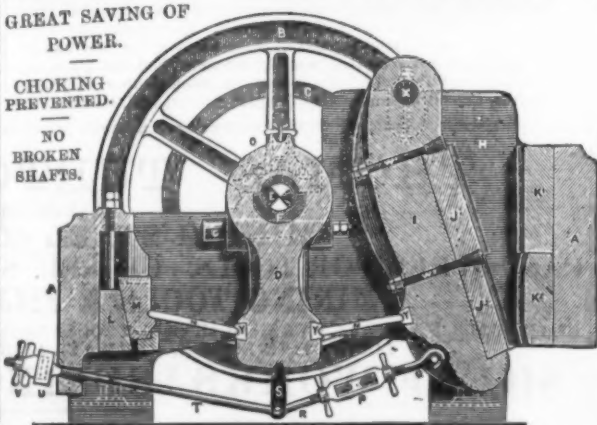
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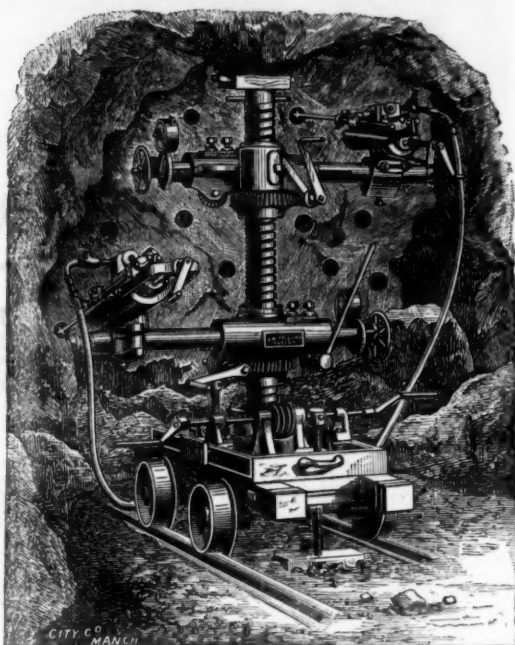
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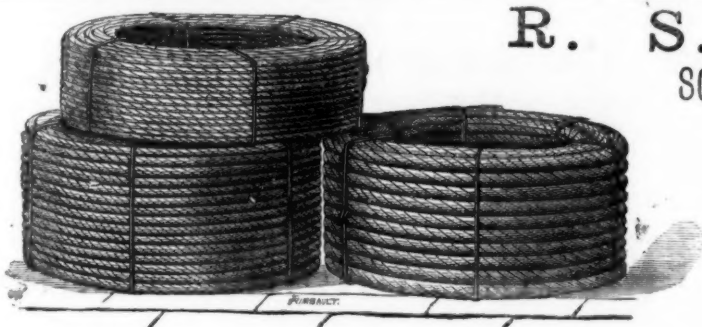


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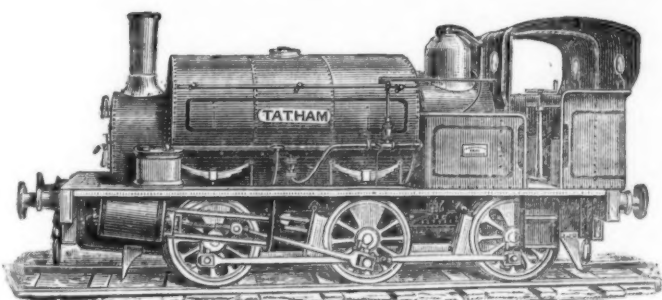
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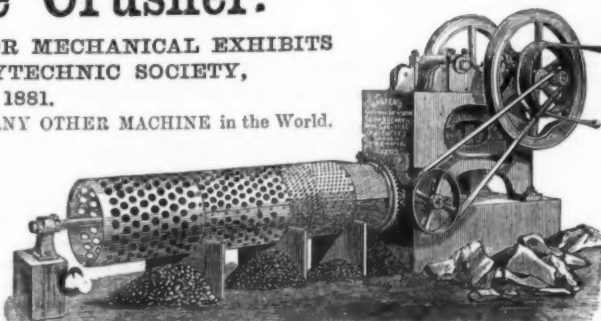
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LADY'S SOLID GOLD WATCH, free by post, for 30s.

Do not pay exorbitant profits, but purchase direct from the workshop.

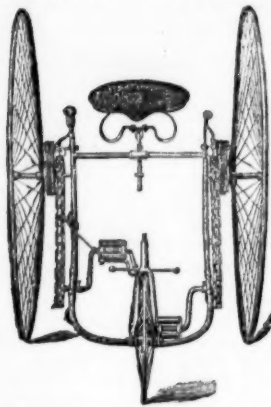
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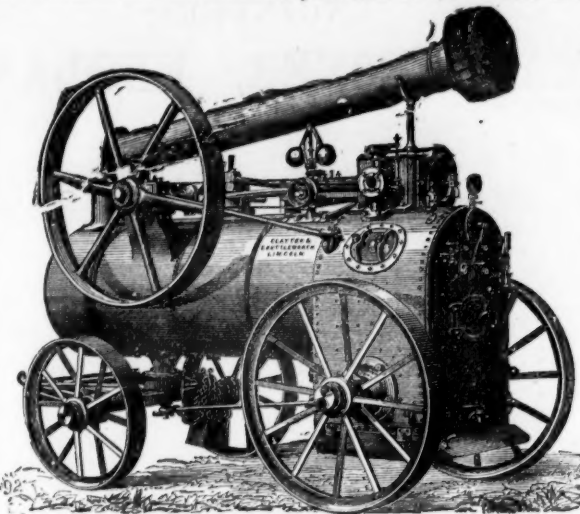
HILL AND MORTON,
TRAFALGAR WORKS, COVENTRY.

M. P. S. HAMILTON (late Chief Commissioner of Mines for the Province of Nova Scotia), PRACTICAL GEOLOGIST, MINING AGENT, and MINING ENGINEER, HALIFAX, NOVA SCOTIA. PURCHASES and SALES of MINING PROPERTY effected, with careful regard to the interests of clients.

SOUTH STAFFORDSHIRE INSTITUTE OF IRON AND STEEL WORKS MANAGERS.—The annual excursion on Friday last was a very enjoyable one, the visit being to the Cornwall Works, at Soho (Messrs. Tangye, Limited). About 40 members assembled at Handsworth Station, and proceeded at once to Messrs. Tangye's Works, where they were divided into parties, and conducted over the works by Messrs. Surtees, Whitehead, and Yeandle, the time occupied in the inspection being about three hours. The Cornwall Works occupy about 20 acres, and employ about 2000 hands. They are admirably laid out, and the systematic manner in which everything is executed commanded unanimous admiration. Amongst the many things inspected and admired were the hydraulic lifting-jacks and other hydraulic machinery of the firm. Steam and gas engines were also seen in motion, their splendid finish and noiseless action being much admired. The Wilson gas producer, gas furnaces, and the Siemens-Marten regenerative furnace also attracted considerable attention. The stamping process of shaping various articles was also much admired. After the inspection the President (Mr. Moses Millard) on behalf of the Institute, thanked Mr. C. H. Treglown (for Messrs. Tangye) for the kindness shown in allowing them to visit the Cornwall Works, and expressed the pleasure he had felt, and heard expressed by the members of the Institute in the inspection. Mr. Treglown said he could, as representative of the firm, assure all those present that it afforded him great pleasure to acquaint the firm of the satisfaction expressed by the visitors. They all knew Messrs. Tangye took very great interest in everything in which iron formed a part. He could say with pride that they would be pleased to know that they had contributed to the stock of knowledge the members of the Institute possessed. All they wished to do was to succeed in pleasing, and then they would be satisfied. He could assure them that the firm felt a personal interest in their institution, and they would do whatever they could to further its interests. Returning to Birmingham the party dined together at the Great Western Hotel. After dinner the President (Mr. Millard) occupied the chair, and the Vice-President (Mr. W. J. Hudson) the vice-chair. The first toast was "The Queen and the Royal Family." The Chairman then gave "Success to Messrs. Tangye, Limited," coupling with it the names of Messrs. Treglown, Surtees, Yeandle, and Whitehead; to which Mr. Yeandle, on behalf of the firm and his friends, responded.—Mr. A. N. Hutton gave "Success to the Institute," coupling with it the name of the President. Speaking of the work of the Institute, he felt sure they had been very successful in the past from what he had seen as a visitor among them, and felt confidence, from his knowledge of the members and their abilities, in predicting success in the future. Visits of the character of the one they had paid to Messrs. Tangye's could not but materially benefit them. Alluding to the puddling process he thought that the days of puddling were numbered, and that the magnitude of that number was not very great.—The President replied, and said that the success of the Institute was entirely due to their energetic secretary, whose name he had hoped would have been coupled to the toast, in preference to his own.

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Chaff Cutters for Steam Power.

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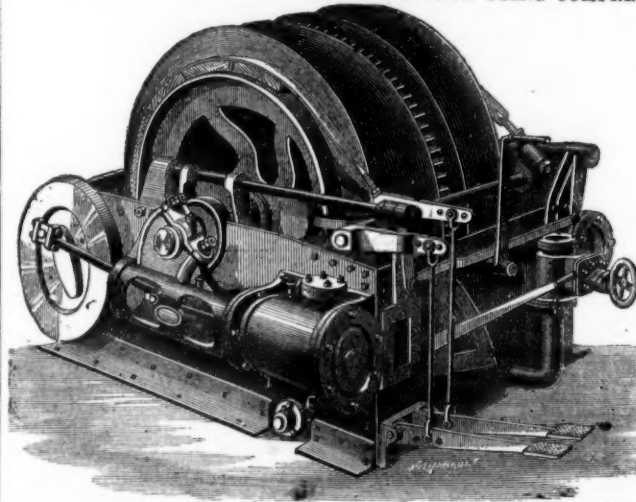
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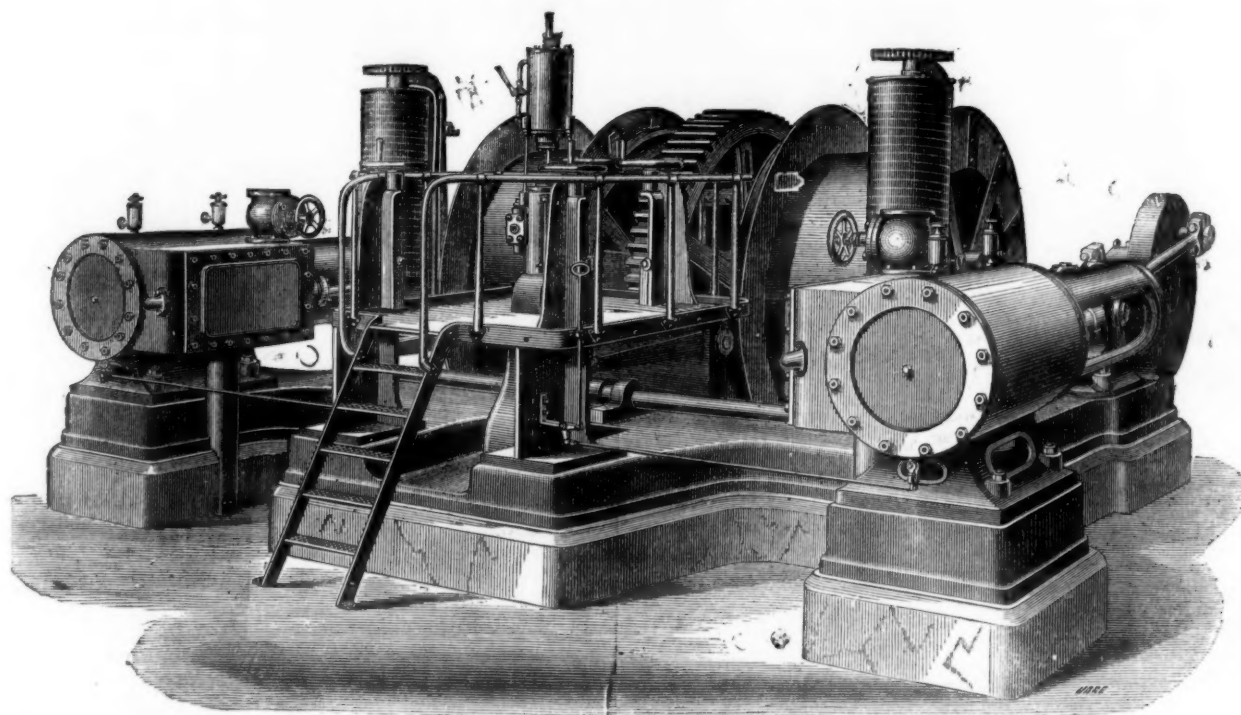
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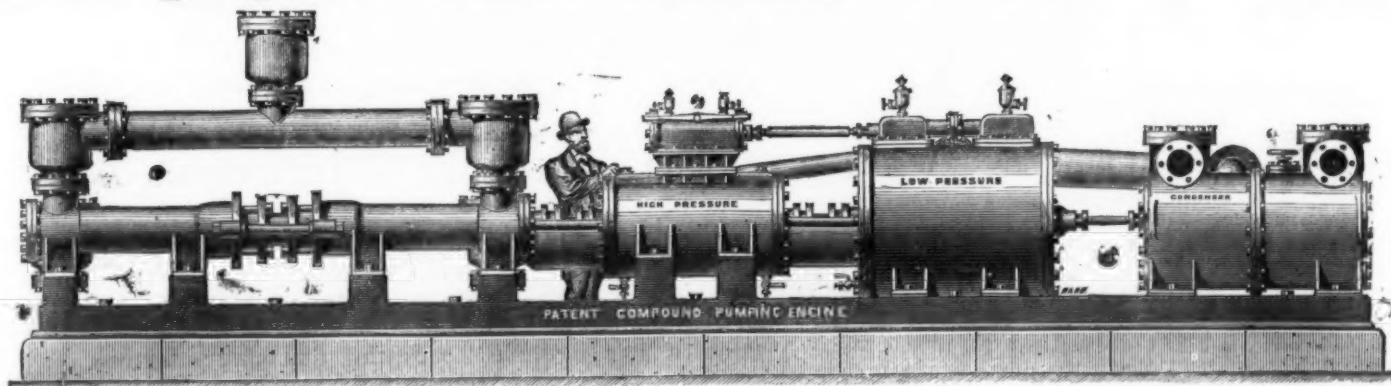
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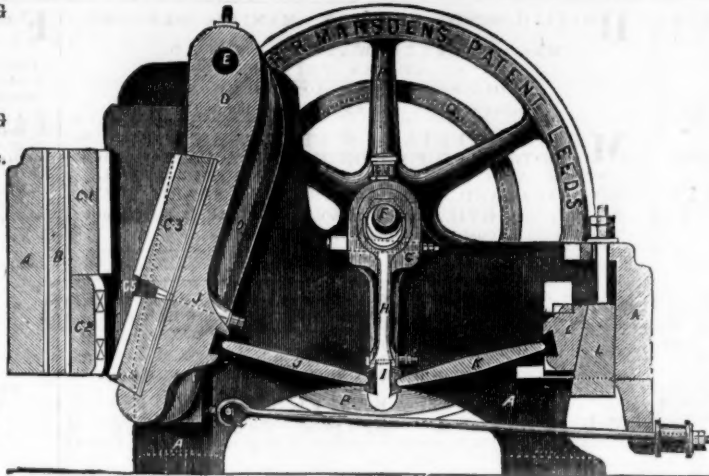
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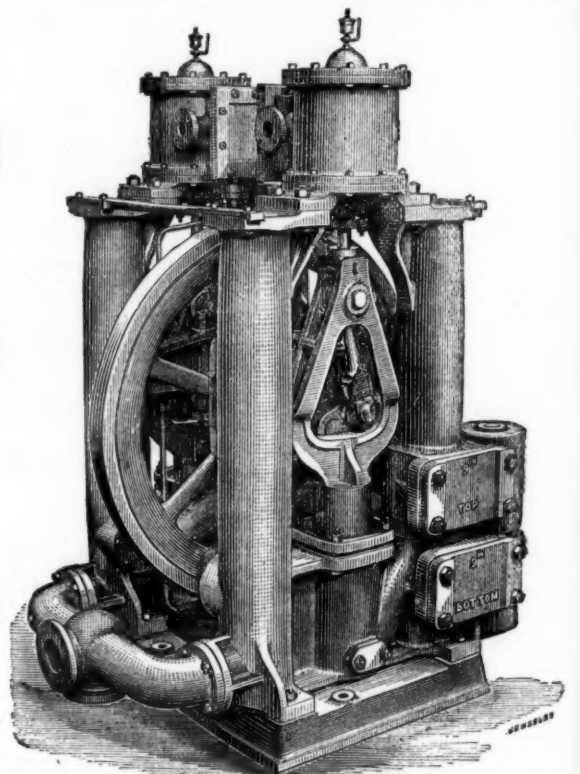
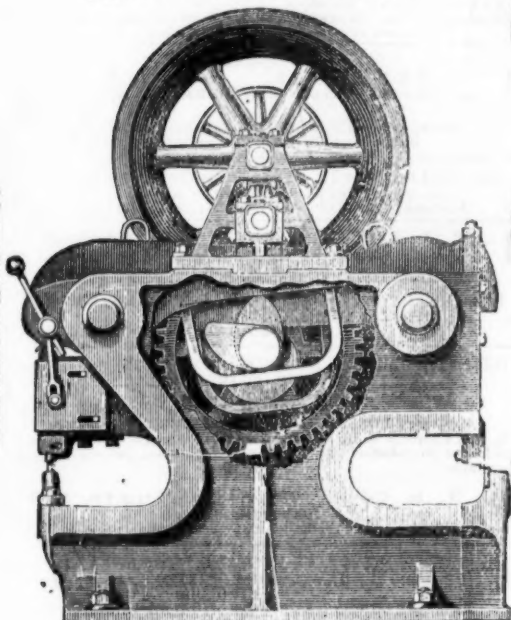
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